

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

JUNE 12, 1950

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# Aviation Week

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June 12, 1950

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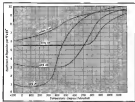
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In wide use is a 36% nickel alloy... aptly named "Invar" because its dimensions remain almost invariable over the range of atmospheric temperature variations. However, as nickel content goes higher, expansion increases continuously. The chart, below, shows the thermal expansion characteristics of Invar and two other high nickel alloys, along with those of carbon steel for comparison.



### FABRICATION

Like all austenitic alloys, those of the iron-nickel system respond well to plastic deformation, either hot or cold. They may be welded by any of the commonly used methods, and users report their machining characteristics are very similar to those of other high nickel alloys such as Monel® and Inconel®. A special, free-cutting grade is available to meet machining requirements.

### APPLICATIONS

Where dimensional changes with temperature must be minimized, or where such changes must approach

those of other materials of relatively low expansion, iron-nickel alloys... sometimes modified by other alloying elements... are almost universally used.

For example... in thermostatic bimetal strip, Invar serves as the low expansion side for use up to moderately elevated temperatures. At higher temperatures, the 42% nickel alloy is commonly used. For the high expansion side, special alloys, containing 15-25% nickel, are used extensively because they develop nearly double the expansivity of iron. Iron-nickel alloys are also widely used in glass-to-metal seals, where expansivity of the glass must be closely matched. The 42% nickel alloy, sometimes with added chromium, is used with soft glasses. Hard glasses call for nickel alloys containing added cobalt.

Seals of other iron-nickel alloy applications include bases for glass telescopes, surveyor's tapes, radio condensers, parts for textile machinery and for numerous precision instruments and devices.

Industrial fields of usefulness for the iron-nickel alloys are far from exhausted. These unique materials can be of inestimable value in improving instrumentation and process control, and in the design of new devices. They are available in various forms including wire, rod, strip, sheet, bars and tubing. Send coupon today for additional information on the properties of iron-nickel alloys... they may be the means of improving your products, equipment, or process.



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## WHO'S WHERE

### In the Front Office

William J. Haley, executive of selling operations of Standard Oil Co. (N.J.) has been made president of Aero Engines Corp., succeeding Frank M. Helling, who will join as a director pending his retirement. Harold W. Fisher is named to GE Aircraft Division position.

Tom Wille has been retained by Pacific Aerospace Corp. to assist in its domestic and international development activities, including a specific expanding jet engine program. Wille has been in various 17 years but has held three prior office positions with Western Air Lines and Pan American World Airways.

Walter J. Hunt has been appointed chief executive manager in the company's Kansas City area, replacing W. E. Brown.

### Travel Log

Montague Earl Myers (right), director general of civil aviation, left Egypt en route to N.Y. to attend the ICAO conference at Montreal and report aviation facilities in the U.S. before returning home in about six weeks. He is accompanied by his wife, Alice Kravner Myers. Oliver Graham of the Egyptian delegation on left is also en route. Dr. Ahmad Fekari (left) has just returned from the Dept. of Civil



aviation, Osama Hamdy, corporate general of the civil aviation dept. (third left), Montague Earl Myers, Egyptian Air representative. W. E. Brown, right now, former for the international air traffic control standards for CAA also on board the flight.

### Retirement

Capt. Wils H. Proctor, line pilot with Aero can Airlines for 22 years, has retired at the age of 56. He made his flight on May 11, donating a route involving 3,000-000 and over 45 miles and 14 foreign countries, and covering 21 different types of commercial planes and 21 types of military craft. He made his first commercial flight for Canadian Airlines (predecessor company of AA) from Buffalo in December, 1927.

## INDUSTRY OBSERVER

[This week's column is compiled from observations of two Aviation Week editors at Montreal last week.]

► Considerable has been said to build 15 more North Star transports for Trans-Canada Air Lines, powered this time with Pratt & Whitney R-3500s. The plan would allow Trans-Canada to trade back 15 of its older North Star transports powered with Rolls-Royce Merlin. Reliable sources say Canadian could then outfit the two-star-old planes in Brazil. This would allow Canada to secure within six months an agreement to sell new planes only in the British Empire. But Trans-Canada is holding back its Boeing's completion in maintenance and overhaul of its base Rolls-Royce and some Pratt & Whitney powerplants.

► Aero Canada Ltd. will send extra savings back to the C-112 jetliner across the Atlantic. Longest flight yet has been 880 mi. The jetliner lost out by a few days to the de Havilland Comet, for the honor of being the world's first jet transport to fly. But now Aero is hoping to lead de Havilland to the first jet transport trans-Atlantic crossing. Two Aero engineers are working to complete Certificate of Airworthiness procedures necessary before the flight. As soon as the C. of A. is complete, probably within a month, look for the jetliner to take off for England.

► The forthcoming non-stop trans-Atlantic flight of the Aero C-112 jetliner will give a significant demonstration of its range and undoubtedly will set a new speed record for the crossing. W. A. Waterloo, British test pilot, who has done most of the plane's flight tests so far, will be at the controls for the Atlantic leg.

► Canadian will sell its new North Star transport to be powered with Pratt & Whitney R-3500s, the DC-5 as possibly the C-5. The designations previously led to some confusion of the new plane with the present Douglas high-wing DC-5 transport.

► Canadian communications experts see a serious problem in the one-two-three RTCA "chicken" system for air weather flying. They assume it will cost about \$700 million for Canada. Yet it will still leave the country without air navigation facilities in the north. They are also disappointed in the shortcomings of the low-frequency Loran system, but believe that their present facilities would "break down" completely under a national emergency military and civil air traffic load.

► North American Aviation, Inc., is expected to handle the engineering involved in putting the Aero Canada jetliner engine into the F-86 jet fighter, at Inglewood, Calif. Since the Canada jet is out of the door, when the installation of the engine in the F-86 probably will be complete, some time this fall. Meanwhile two Canadars are ready to go for first flight within 10 days in the outboard section of a Lavender test-bed plane. Aero is also investigating alternative possibilities for the Canadars.

► At least one Canadian aircraft executive is unhappy about efforts in the International Civil Aviation Organization to standardize aerobathic requirements. His point is that any such standardization leaves design and operating latitude. He says implications, for instance, have never had to meet such detailed requirements as to make it difficult to improve performance or produce a radically new ship. Significance of this view is that the executive represents de Havilland, which produces the jet-powered Comet transport, among other planes.

► Canadian Ltd., Montreal, at the present time is flunking most in terms of transport rather than transport for its future jet turbine transport. Canadian officials say its Canadian Four (DC-4M-4) is readily convertible to turboprops and that will be the next step.

► De Havilland Aircraft of Canada is demonstrating its Beaver bush fighter in a spray plane. Officials say the Beaver meets all requirements for an agricultural plane recently laid down by U.S. experts.

► Trans-Canada Air Lines is modifying the exhaust system on the Rolls Royce Merlin engines of all Canadian DC-4Ms to reduce the noise level.

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## AVIATION CALENDAR

June 16-25—International arm exhibition, Congress Palace, Brussels, Belgium  
June 15-14-Mid year meeting of Aviation Development and Manufacturers Assn., La Salle Hotel, Chicago

June 12-14—Conference on costs, budgeting and economics at industrial research, development of industrial research, Columbia University, New York

June 12-16—AIEE summer and Pacific gun and meeting, Huntington Hotel, San Jose, Calif.

June 19-21—American Society of Mechanical Engineers annual meeting with Institute of Aeronautical Sciences and American Helicopter Society, New York  
ASME aviation division in two helicopter engineering sessions, St. Louis

June 24-25—Navy/Navy 1950 convention, Ft. Clark Hotel Ranch, Bethesda, Md.

June 26-14—Civil aviation meeting, American Society for Testing Materials, ninth exhibit of testing apparatus and related equipment, Chatham-Hall Hotel, New York City, N. Y.

June 29-July 1—1950 annual meeting of Institute of Navigation, Los Angeles, Calif.  
July 7-8—Royal Air Force 1950 display, Farnborough airfield, England

July 10-14—Air Age Institute lecture series, Park Air College, St. St. Louis, Mo.

July 12-14—Annual summer meeting of the Institute of Aeronautical Sciences, western headquarters building, Los Angeles

July 16-18—Third efficiency test and air show, sponsored by Municipal Aviation Club, Inc., Mansfield, O.

July 21-25—Sixth annual All-Glass air show, sponsored by Cleveland Junior Chamber of Commerce.

July 30-Aug 13—17th National Flying Circuit, Grand Prairie, Tex.

Aug. 2-14-17th National Sporting Contest, Grand Prairie, Texas

Aug. 7-Letter Club Air Meet, Air Harbor Airport, Concord, Ontario, Canada

Aug. 13-15—Special two-day program on high temperature research, Massachusetts Institute of Technology, Cambridge, Mass.

Aug. 14-20—California Air Flight Clinic, sponsored by Calif. Association of Comm. and Civilian Pilots, San Francisco, Calif.

Sept. 24—National Air Race, Cleveland

Sept. 5-18—Eleventh Flying display and exhibition, Society of British Aircraft Constructors, Farnborough airfield, England

Sept. 7—Hunt & Wilson International operation and maintenance meeting, Pacific Maritime Corp., London, N. Y.

Sept. 14-22—Fifth national aviation conference and exhibit, Memorial Auditorium, Buffalo, N. Y.

Oct. 12-15-5th annual aviation conference, sponsored by aviation committee of Texas Governor's Council

**PICTURE CREDITS**  
Top—TWA; 12—TWA; 13—TWA; 14—TWA; 15—TWA; 16—TWA; 17—TWA; 18—TWA; 19—TWA; 20—TWA; 21—TWA; 22—TWA; 23—TWA; 24—TWA; 25—TWA; 26—TWA; 27—TWA; 28—TWA; 29—TWA; 30—TWA; 31—TWA; 32—TWA; 33—TWA; 34—TWA; 35—TWA; 36—TWA; 37—TWA; 38—TWA; 39—TWA; 40—TWA; 41—TWA; 42—TWA; 43—TWA; 44—TWA; 45—TWA; 46—TWA; 47—TWA; 48—TWA; 49—TWA; 50—TWA; 51—TWA; 52—TWA; 53—TWA; 54—TWA; 55—TWA; 56—TWA; 57—TWA; 58—TWA; 59—TWA; 60—TWA; 61—TWA; 62—TWA; 63—TWA; 64—TWA; 65—TWA; 66—TWA; 67—TWA; 68—TWA; 69—TWA; 70—TWA; 71—TWA; 72—TWA; 73—TWA; 74—TWA; 75—TWA; 76—TWA; 77—TWA; 78—TWA; 79—TWA; 80—TWA; 81—TWA; 82—TWA; 83—TWA; 84—TWA; 85—TWA; 86—TWA; 87—TWA; 88—TWA; 89—TWA; 90—TWA; 91—TWA; 92—TWA; 93—TWA; 94—TWA; 95—TWA; 96—TWA; 97—TWA; 98—TWA; 99—TWA; 100—TWA

## NEWS DIGEST

### DOMESTIC

John A. McCone, was confirmed by the Senate last week as undersecretary of the Air Force following resignation of the Los Angeles Republican by President Truman. Other top Air Force chiefs, Maj. Gen. William H. Koppert, from consultant, Air Force Command, Eglin AFB, Fla.; to command-in-chief, Alaska Commanded, Lt. Gen. Lucien N. Starnes is expected to be named vice chief of staff, replacing the late Gen. H. H. Arnold, Jr. Gen. Nathan F. Twining, command-in-chief, Alaska Commanded, is expected to be named deputy chief of staff for operations, succeeding Gen. Norstad.

FAA-MOA merger agreement has been extended until June 30. Previous deadline on the time within which government approval of the merger could be obtained was June 15.

Sales of aircraft, engines, propellers and parts for the first quarter of 1950 totaled \$554 million, Bureau of the Census reports. Aircraft and parts sales amounted to \$167 million, engines and parts to \$176 million. Total backlog at Mar. 31, 1950, was \$2934 million, of which \$1885 million was for aircraft and parts, and \$761 million for engines and parts.

Personal aircraft shipments for April amounted to 523 planes valued at \$1,991,000, eleven companies reported to the Aircraft Industries Assn. March shipments were 324 planes valued at \$1,323,000.

CAB is discontinuing against them, says Eastern Air Lines and Braniff Airways. The Board suspended fines \$60 by EAL, Braniff and Delta Air Lines, reporting discontinuation of the last airships still in effect domestically on DC-6 and Constellation. EAL and Braniff say CAB in the past has reported discontinuation of the airships in other parts of the country, and they ask reconsideration.

Cash in Atlantic Ocean of C-46 based from Puerto Rico to Wilmington, N. C., loaded in six crates, with 22 manning, of the aircraft 65 percent aboard. Plane was diverted from West Air Co., Tulsa, Wash.

Mass air crash service is planned. Chicago and Southern Air Lines is the first to add CAB for passengers to can low-fare flights. C-46s went to short Sp. passenger DC-4 flight July 2 be-

tween Chicago and New Orleans with stops at St. Louis, Memphis and Jackson.

Two airlines are going on the congressional carpet. Pan American, before Rep. Emanuel Celler's subcommittee of the House Judiciary Committee, Northwest, before Sen. William Fulbright's Senate Banking and Currency subcommittee. Celler wants to find out if PanAm is a monopoly in violation of the antitrust act; Fulbright, clanking up on the RFL, wants to know NWA's progress since it got RFL guarantees on a \$12 million loan a year ago.

Airlines Written Asia, in annual convention in Montreal, elected Axel E. Tolbert, New York World Telegram, president, Ralph G. Pratt, Cleveland News, first vice president, Vernon Rensay, Beaumont Journal, second vice president, William E. Cowfield, London (Ontario) Free Press, third vice president, Gerald B. Dobbin, American Airlines, secretary, Leslie V. Spitzer of Birmingham, Controllers & Pierce, treasurer.

High speed wind tunnel will be constructed at Langley Laboratory by Flight Corp., Pittsburgh, under \$2,540,000 contract from NACA.

### FINANCIAL

Braniff Airways reports system wide net loss of \$180,000 on \$4,473,755 gross revenue in first-quarter 1950 against \$370,000 loss on about \$4,570,000 gross revenue in same period last year. But E. E. Brown, president, expects first half year to be profitable, and for the year to have "very satisfactory operating results."

### INTERNATIONAL

International Aviation Building in Montreal was dedicated in ceremonies participated in by Canadian, airline, IATA and ICAO officials. Building adjacent Montreal's Central Station, houses ICAO, IATA, international airlines serving Montreal, and has a concourse 80 ft. by 200 ft. Cost—\$4 million.

Foundation Internationale Aeronautique meeting in Stockholm, adopted Yugoslavians to membership. Turned down: Bulgaria, Romania, Korea for not meeting requirements. Funded to meet character to technical meeting Western Germany, which is forbidden any aviation activities at all.



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**YF-96A** Takes off from Mexico on test flight piloted by Republic's O. F. Hunt. Flight based on loan. Craft has 66 percent of F44 tooling, has a 5700-lb. thrust Allison J33-A-35.

**CANBERRA-B2** Twinstar being produced for the RAF by English Electric shows up in eight bomber variants and displays modified nose with new bomber's engine panel, also shows dual fin. Two Rolls-Royce Avon turbofans turbojet provide over 6100 lb. thrust each. Cables as procurable. One of the outboard engine inlets is in the wing while about 118 in. The Canberra will also go into production in Australia.



**HQ-35-IG** Slender 5-1/2 helicopter used by the Coast Guard sports a 57-gal auxiliary fuel tank at isolated externally in the starboard side of the fuselage. The increased fuel capacity is reported to increase the craft's flight endurance 1 hr., giving a total of 5 1/2 hr. flight time. The rotor has a main shaft driven on the port side. Powered by a 400-hp. T602-Wasp, top speed is approximately 120 mph and normal range is 250 mi. Churn at sea level at 5500 ft. Gross weight is 1600 lbs. Helos may be attacked externally on either side.



**SB-29** Boeing Superfortress gets an A-1 dropable without a 160-in. diameter chute. Flares thus fired are being used by MATS as on station server. Bunters B-29s are being modified for this work. Latest forward gun turret is removed to allow installation of the 50-ft. all aerial boat, which is powered by a four-cylinder water-cooled engine. The SB-29s are scheduled to replace SB-47s now being used, with final deliveries scheduled for October 30. Four more will be based in Alaska, Guam, Germany, and Japan.



# AVIATION WEEK

VOL. 52, NO. 34

JUNE 12, 1959

## More USAF Business to Go to Canada?

New meaning put on "Buy America Act" may send about \$25 million across border.

By William Kroger

**Montreal**—The Canadian aircraft industry is about to become a more important partner in North American air defense—but some U. S. manufacturers may not like it.

A new interpretation of the "Buy America Act" of 1933 will permit the U. S. government to buy in certain equipment in Canada in the Department of Defense. The act, which is still a hot issue, but the figure usually mentioned here is \$20-\$25 million a year.

In the past, the U. S. government has been forbidden under the act to put chase outside the country—except under emergency conditions—when that manufacturing in the U. S. Canadian government and aircraft officials here last week said they thought about two weeks ago Defense Secretary Johnson had issued a directive modifying the regulations interpreting the Buy America Act in Washington, Defense Department spokesmen and they were unaware of such a decision. Canadian, positive that if the regulations haven't yet been altered they clearly will be, are looking plans to capitalize on the change.

Referenced Canadian here expect two big orders eventually to stem from the new policy.

- **The Harrier**—Bombers bought by the U. S. Air Force for Arctic service work.
- **AN-108**—Low cost jet fighter bought by USAF for night and operations use.
- **Propaganda**—Of the two, the Beaver order is more certain. Months ago, Col. Robert Bickler, USAF's expert on Arctic flying, put in a strong recommendation for de Havilland's sturdy bush fighter. An order later for 24 actually was prepared and was going through channels when the Air Force renewed the Buy America Act. USAF bought Canada 19th order. The civilian type Beaver will for \$3.50M, at a maximum the expected USAF contract would total about three-quarters of a million dollars.

No price has been decided on the CF-105. This plane would run into airframe competition with U. S. comes before than would the Beaver but

Canadians feel the CF-105's long range (it will try the Atlantic crossing now) and its power (two Rolls-Royce Avon of more than 5500 lb. thrust) offer a better performance than planes of Lockheed, McDonnell, North American, Northrop and Republic designed for the same purpose.

► **Deposits**—John—Licensing of the Buy America Act is applied to Canada comes after a long fight campaign by the Department of Defense. The act, which is still a hot issue, but the figure usually mentioned here is \$20-\$25 million a year. It is a time to prohibit the government from buying anything outside the country that would make the employment situation worse.

Times have changed, Canadian officials recently have said. There is no department now, and Canada is expected to be a partner with the U. S. in defense matters. Canadian air force's why the Buy America Act doesn't make sense.

- **To be a full partner** in an defense of North America, Canada must strengthen its air force, to do this, she must lose certain equipment from the U. S.—for dollars.

- **To get dollars** Canada must sell to the U. S. at least as much as she buys; perhaps, a little more in view of the unfavorable exchange rate.

- **Canada has equipment** the U. S. needs and can't get elsewhere.

Because of these reasons, the bid on buying from Canada has been lately around the edges for some time. The most notable instance has been the purchase from Canada of C-47s spare parts produced by Canadian Ltd., Montreal.

- **Spares**—Wing—A partly Canadian explanation of the spare parts sale is this: After the war, Douglas Aircraft Co. decided the C-47 (DC-3) type was obsolete and was little interested in its future. Canadian stepped in and bought a large quantity of surplus C-47s spare parts. Later (in 1946), Canada obtained a license from Douglas to make and sell C-47 spares.

Douglas now is using Canadian, changing a violation of that agreement and as earlier floating arrangement with the

Canadian government (subsequently turned over to Canada) for manufacturing of DC-4 type aircraft and spares. Douglas now Canada has sold spares to the U. S. government.

Canada says the spares have been sold to the Canadian Commercial Corp., the Department's procurement agency, which sells to the U. S. So far, a deal between the two governments, Canada's deal with the Air Force. It keeps the Air Force advised of what C-47 parts it has and is manufacturing (most of the surplus spares have been sold), and sends an informal working arrangement USAF buys about 60 percent of its spare C-47 parts from Douglas and the balance from Canadian through the CCC. Canada has said about 37 million worth of C-47 spares to USAF in the past few years.

► **Long-term**—All this has to do with the Buy America Act is two ways USAF couldn't get certain spares any place except from Canada, and with each order to the CCC goes a letter from the secret secretary of Air Force saying that the material being purchased is necessary to the defense of the U. S. and is reasonable in the U. S. Only through such an "exception" has it been possible to arrange the Buy America Act as it applies to Canada will work toward increasing Canada's value in the common defense of North America by strengthening the Department's aircraft industry. It will give Canadian manufacturing a big market. By finding Canada's defense supply it will enable Canada to buy the U. S. defense items not possible before.

U. S. manufacturers could be persuaded to not leave Canada to participate in strengthening Canada's aircraft industry. A Canadian's order's productivity, it is said here, is about equal to that of the U. S. worker. But the Canadian works for about 40 percent less per Canadian production facilities and being compare favorably with those in the U. S.

The Beaver and the CF-105 are the two biggest immediate competitive threats for U. S. aircraft manufacturers. But Canada's potential competition, can be played by changing the Department's aircraft manufacturing habits.

- **Canada, Ltd.**, is the largest aircraft manufacturing firm, with total sales of 1,650,000 in its two plants. Employment expected to exceed 1950 level this year. Since the end of

the war it has turned out 71 four-engine transports, in addition to carrying on a large modification program.

It is now tooling up for manufacture under license of the North American P-50 for the Royal Canadian Air Force. First plant is due in the fall. Production has been delayed because of shakedown to the latest model, the P-50C. First planes of the initial order of 160 will be powered by GE J47 engines, with later versions using the Avco Overland (see Industry Observer).

Under the Canadian North American license agreement, Canada could not sell planes or parts to USAF even through the CCC. But in one of a production agreement in North America, some way out of the agreement might be negotiated.

• **A. V. Roe Canada, Ltd., Toronto**, now is supplying about 4000 engines or prototype production of the Jetstar, the CF-130 and the Dolphin anti-fuse jet engine. U. S. certification of the Jetstar is being pushed and Avco feels chances for sale to U. S. airlines are fair. That payment will be reduced by the Bay America Act. But a sale to USAF for testing or experimental purposes would be possible by the new interpretation of the act, or through the exception clause. Some in fact of the Canada engine.

• **De Havilland Aircraft of Canada Ltd., Toronto** has a small hard core of workers, now numbering about 100, around which rapid expansion could take place. In addition to the Beaver, de Havilland has the Chipmunk, two-place military primary trainer, now being produced at a rate of ten a month.

The Chipmunk has been made the standard British Royal Air Force trainer and is being produced by the parent factory in England. This plane might possibly be a competitor for USAF or Navy business, though this is unlikely in view of the U. S. trend toward heavier and faster trainers.

• **Increasing suppliers who could offer keen competition to U. S. suppliers.** Significantly, Avco's Jetstar contains 80 percent Canadian produced equipment and materials, and its CF-130 about 90 percent. Many of the Canadian supply firms represented in were established by British aviation companies.

While there might be strong reaction in Canada to aviation protection money going to British firms, there is a good chance that the same situation wouldn't be heard against purchases from Canadian companies of equipment manufactured under license from a British firm.

▶ **Low Prices—In specialties and in volume.**

tells here, Canadian officials say the industry in the U. S. Canada unity chorus. Undoubtedly they will keep working to eliminate any restrictions in the Bay America Act against Canadian purchases. They realize the importance of closer cooperation in purchasing between the RCAF and the USAF. But they realize also that, prevented to bid on even terms, Canadian prices probably would be lower.

## Three Big Nonskeds Slapped by CAB

Civil Aeronautics Board last week ordered an enforcement drive against large irregular air carriers (see story on page 46) by cracking down on three of the nation's most important non-scheduled operators.

• **Viking Air Lines, Berkeley, Calif.**, which has flown the transcontinental route extensively, had its letter of registration revoked for "knowing and willful violations of the Civil Aeronautics Act."

• **Transwest Air Lines, Oakland, Calif.**, largest U. S. coast-to-coast, and Southwest & Western Airlines, New York, trans-Atlantic cargo operator, were ordered to cease and desist from "certain knowing and willful violations" of economic regulations.

CAB ordered Viking's letter of registration revoked effective July 5. On that date the non-scheduled operator must stop carrying directly or indirectly in air transportation. The company was also ordered to cease and desist from further violations of the Civil Aeronautics Act between now and July 5.

▶ **Two More, Flights—According to CAB, Viking had operated more flights than permitted under its authorization as an irregular carrier, had failed to report all flights to the Board, charged fares other than those fixed with the Board, and failed to file required data.**

Transwest was found to have violated the Civil Aeronautics Act by carrying passengers in foreign air transportation without proper authority from CAB. The Board said Southwest violated the law by operating a regular cargo service by carrying persons in foreign air transportation, circumventing regulations in reporting to CAB, providing transportation free passenger transportation between the U. S. and Europe, and failing to observe tariff rules.

In putting Viking out of business, CAB said the carrier had evidenced such a persistent disregard for regulations that complete revocation of operating authority was necessary. But the Board divided that Transwest and Southwest had made efforts to comply with the law, hence the lighter action.



NAVY A2D, shown in a Douglas test version at right, is the first conventional turbo-prop attack bomber.

## Douglas Skyhawk Makes First Flight

By Thomas M. Sell

Tight tests of Douglas Aircraft's new Navy attack bomber, the turbo-prop-driven A2D Skyhawk have been highly successful, with hardly any "bugs" showing up in the first week's tests, the company announced.

Douglas has no order for these prototype models of the ship. And West Coast aviation observers expect the Navy will rush through an order for another two.

The Skyhawk's debut, following by two months the Convair F5Y flying boat, gave the Navy its second flying turbo-prop aircraft. With the jet, Navy will completely explore the capabilities of the turbine-propeller combination, a project it kept alive on the side of the ocean, though concentrating its main efforts on turbojets.

For Douglas, the A2D is a turbo-prop power development between maintaining reciprocating engines and fueling jet types.

▶ **Skyraider Successor—Douglas designed the Skyhawk as a fighter, never possible successor to the A1H Skyraider. But the company is also betting the A2D as an ideal plane for close support of all ground troops. Douglas people point out that a ground support plane should be able to hover over the fighting area, hovering down on rail and carry the A2D can do that very readily by cutting out one of its T-40 Allison twin turbos. Takeoff characteristics adapt**



## P&W'S TURBINE RESEARCH LAB

The half-acre view of Pratt & Whitney's new \$12 million Andrew Wigotz Turbine Laboratory in E. Hartford shows layout of what is believed to be the largest primary closed jet turbine facility in the world. It is expected to be in full operation this summer. At least left a pump house for sending 210,000 gpm of water through the lab, and level water is necessary for returning water to Connecticut River right building in longways around two test cells for burner components or entire jet engines, and buildings equipped control service equipment within for producing power

necessary for testing. Behind risk are two adjacent 150 ft long hot cells—one for compression, the other for turbine engines or their subunits. "Full hot" staged stations put above the chambers, on the right of the lab and behind the hot test cells are full expansion chambers of the lab's underground silencing equipment. An exhaust right is a portion of the tank from having a capacity of 11,776 bushels of oil and water, fuel stored in the engine left, just above pump house, on screen above for the compressor laboratory which is already in operation.

the Skyhawk to keep ranges or extremely short fields in forward combat areas.

Naval announcements state the Skyhawk combines the speed of modern jet propulsion with the payload and economy of conventionally powered aircraft. Navy expects the A2D will come close to jet fighter performance except for high speed. It can climb to altitudes of 40,000 ft, can carry a heavier load, and has greater range. In addition it carries a load of bombs, rockets, or typelikes.

Payload will be greater than any known jet bomber or fighter for the same expenditure of fuel. Additionally, the Navy announced said, the Skyhawk's fuel is only a function of any other tactical support aircraft with its payload capacity.

In a first interview with T. H. Hirschman, chief engineer of the Douglas El Segundo plant, and designer of the Skyhawk, Avionics Week learned these details of the ship's expected performance.

► **Performance Data.**—Payload speed is about 150 mph with latest A2D-10s counter-rotating propellers. With improved propellers, Douglas expects speed can be boosted to 600/700 mph. (In a recent report before the NAS in New York, Rear Adm. C. M. Bledsoe, Asst. Chief of Staff for Research, said that even at Mach number of .85 to 1.00 at 40,000 ft the turboprop could compete with the turboprop of the propeller efficiency of the propeller is equal to or greater than about 75 percent.)

Compared with jet reconnaissance aircraft, the Skyhawk has double the rate of climb, twice the

ceiling, and 100 to 150 percent speed. And it carries a greater load, and is a heavier plane, weighing 17,000 lb.

With wing-borne loads will be about 100 lb.

The A2D-10s improve the A2D overall flight-organic performance together with the dependability of twin engines.

When Douglas loses its turboprop development, engineers decided to follow the design of the A2D in closely as possible, but the inevitable changes in size, speed, etc. dictated many changes.

Yet, generally, you can see the traditional AD lines in the planform.

The Skyhawk has the same wing span and wing area, but wing and tail surfaces are thinner. Landing gear strut is longer.

Cockpit is located farther forward, giving the Skyhawk's downward vision angle somewhat better than the AD's respectable 15 degrees. Cockpit has been designed to protect pilot in crash and for efficiency and convenience of control operations.

Single engine turboprop is used instead of plastic to give best performance on hot days. Double engine was not available in that plane was started. A detachable seat is used because the launch chair developed for the F1D Skyrocket is not practical with turboprop engines.

► **Stores External.**—Like the AD, the Skyhawk carries its stores externally instead of in a bomb bay. External bomb racks permit carrying of bombs, napalm, 100-lb rockets, or dropable fuel tanks in nearly any combination. In addition to the three main bomb racks, rocket launchers are provided on the

wing wings for 5-in. rockets.

Five bomb load per jet in his has been increased 50 percent, but without any loss of ton of bombs per jet in view as AD. That gives the Skyhawk increased efficiency without an excessive payload increase in economy.

An A2D-10s-combination jet fuel tank and turbine starter enables the A2D to operate without outside refueling.

While the A2D will probably make a good independent surface plane, it is expected the Navy will continue to use the AD for that purpose, it's considered perfect for endurance and covering large areas of ocean.

In developing the successor to the AD Skyhawk, Douglas engineers expect turboprop at first that studies showed they didn't have the loading speed, load or endurance characteristics needed.

Navy's interest in turboprop was aroused up in a Bureau of Aeronautics conference in 1945. "Propeller-type gas turbine engines to be probably a more useful all-around power plant than the simple turboprop, at least for the majority of Navy aircraft applications."

However, because even the simplest propeller-driven gas turbines are considerably more complicated and difficult to develop, the Navy concentrated its immediate developments on the turboprop.

It now hopes that most of the lessons learned in turboprop development can be applied to the propeller gas turbine.

First flight at Edwards AFB was made by George Jenson, captured World War II veteran who has a Douglas test pilot for five years.



PHOTO TORNADO GETS SLEEK SMOOTH

Latest version of North American's first jet bomber is the RB-45C photo reconnaissance version sporting a new, highly streamlined nose. The RB-45C is fitted with five camera stations. Missions will include day and night

reconnaissance at high and low altitudes, charting, mapping and photography. Maximum takeoff weight is 110,000 lb., cruise weight is 46,000 lb., and second tactical mission is over 2,000 mi. when empty tanks

are fitted. Range can be extended by using bomb-bay tanks. The four General Electric J-47 jet engines have a normal cruise thrust of 12,000 lb. each. RB-45C is in production at Long Beach.

## CAB Chief Helped By Reorganization

Major sweeping of top-level functions of government and aviation bodies is expected to reach down the recently approved governmental reorganization plan. Changes in working-level operations will be minor.

Immediate effect of the reorganization was felt principally by the Civil Aeronautics Board.

► **Boarder Authority.**—Based Chairman Joseph O'Connor, Jr., had his authority increased with delegation of many duties and responsibilities previously carried on by the Board as a whole. Under the reorganization approved by Congress, he has control over all Board personnel, the distribution of work among Board units, and the use of funds. However, his appointment of staff heads, and allocation of funds is subject to Board approval. The reorganization should expedite Board action by vesting control in a single administrative head.

Effect of the creation of a new Commerce subcommittee, for transportation under the Civil Aeronautics Administration was delayed. The committee of 14 trained pilots were completed.

► **Revised Fts In-** First impressions at the Commerce Dept. were that CAA Administrator Delmo Bantrel, who generally speaking has been handling CAA to the satisfaction of Commerce Secretary Charles Sawyer, would continue with little change in the operating procedures.

It is expected that Maj. Gen. Philip Herring, who has been transferred for the undersecretary post, will take over aviation matters directly concerned with CAA, heretofore handled by Tom Davis, assistant secretary of commerce for Air. Davis is expected to devote his attention to other matters. Bantrel's Administration Bantrel has been reporting directly to Sawyer on some matters and working with Davis on others.

Any real shift in the top level operations however is expected to wait until formation of General Herring to the Senate, and his return from a projected European trip.

The new Commerce transportation plan makes Secretary Sawyer directly responsible for maritime affairs, policy and law much of this will be delegated to the undersecretary is not yet clear. Eventually a clear coordination of the various transportation functions of government including public roads, water ways, maritime, and aviation under the undersecretary is a logical project.

Overall, Secretary Sawyer becomes a much more powerful figure in government, with his light control of CAA and other operating agencies of the Commerce Department, and aviation have enjoyed more independence.

Yet another reorganization proposal now pending in Congress would still further increase Sawyer's power. This would transfer activities of the Reconstruction Finance Corp. to the Commerce Department also, thus giving him control over RVC loans to business, including aviation firms borrowed.

► **Patron Sore.**—There is a distinct possibility that the civil aviation agencies may eventually follow the pattern of the maritime reorganization plan. This makes the chairman of a new Maritime Board also the administrator of the Maritime Administration. Under this combined setup the board and administrator are "subject to general policy guidance by the Secretary of Commerce in the performance of policy functions."

The maritime reorganization plan was originally fought by Air Transport Association, because it seems to favor the establishment of a similar setup for commerce. A Senate attempt to veto it failed on a 14 to 79 vote.

► **Possible Changes.**—In place of the old independent five-member Maritime Commission, the new plan establishes as the Commerce Department a three-member Maritime Board (see regulations) and a Maritime Administration for operations and promotional functions. The new board will parallel the CAB, and the Maritime Administration, the CAA.

Stuart Tipton, general counsel of Air Transport Association, last principal office spokesman in the Maritime plan.

► **Little Independence.**—"It is unrealistic

to expect its chairman, an agent of the independent Maritime Administration, to hold the day, to change policy for the night and to be independent."

► **Arbitrary nobody calling.**—Under "general policy guidance" the Secretary will impose an arbitrary crying on officials. Doubtless orders might have to be directed to keep shipping schedules within the existing framework.

Transportation Association of America has asked the plan "direct steps to transfer complete control of transportation into the executive branch of the government. They would agree the door for executive manipulation of functions which should be completely removed from the play of power politics. It is all evident they are but a instrument of other interests toward the mar and."

## Copters Make Mark in Rescue Work

Increasing value of the helicopter for rescue work was highlighted last week when the New York City Police Dept. took delivery of three new Bell 47 D10s for replacement for an earlier Bell 47-10s. By police officials with helping over 20 lives in its two years of service.

One Bell 47 helicopter so completely proved its value, the N.Y.C. Police Dept. decided to expand their fleet.

The city plans to do this to the tune of \$750,000, cost of the three new copters. They are among more powerful 200 hp. Franklin engines in place of the 175-hp. Franklin.



MAJOR GETS A DOLLY

An engine dolly for carrying the Pratt & Whitney Wasp Major power plant shown in the C-119F is being developed by Pratt & Whitney. Fully assembled, weighs 41,000 lb. Wasp engine the entire assembly is said to weigh 45,000 lb. The

transportable unit is made of aluminum alloy and has contra-rotating wheels, which are fitted in front between the carriage rails on the dolly. The dolly has eight bolts. Three of the engines in these dolly can be moved at a time in the C-119.



# Turboprop B-36 Flight Date Set

New model of big bomber due in 1952. Boeing B-52, to fly about same time, seen as B-36 replacement.

The first turboprop B-36 bomber with swept wings is scheduled to begin flight tests early in 1952, according to Avrocan Wings Inc. located in

June 1954, tentative Air Force schedules call for equipping at least two bomber groups with the 500-hp, very heavy bomber. The plane will probably carry a B-52 design.

Meanwhile the Boeing XB-52, eight-jet bomber (shown as the B-36 replacement, is due to be ready for flight test early in 1952. It is expected to progress sufficiently in the following year, that today for production delivery can be started when the plane is ordered into production. This would make it possible, Air Force sources say, to have the first production B-52 ready for operational assignments of the B-36 around 1954.

Current Air Force thinking is that 100 of the sweeping turboprop B-36 bombers will be ordered out of fiscal 1952 funds. However, production of the B-52, once planned, then delayed, would for two prototype models (XB-52 and XB-52A) be ordered in fiscal 1953. Work B-52, 27, may be resumed. According to present plans subsequent production of the B-52 will be given to the experimental stations. It is estimated that the B-52, with a 100-hp engine, will be ordered in fiscal 1953. Boeing is to get the B-52 into production.

► **Power Factors.** Behind USAF decision to field two B-52 production is the fact of the sweeping B-36 is economy. The B-36 now costs about \$4.5 million each. Initial production cost of the Boeing B-52, is about \$7.5 million each plus tooling for quantity production.

Development studies of the turboprop version of the B-36 (Avrocan Wings Inc. 14, 1945) first considered use of Allison double turbine, 7,400 3500-hp. turboprop engines. Present planning indicates probable alternate use of 5000-hp Pratt & Whitney PT 1 turboprop engines, now under Navy development contract.

► **Performance.** Performance of the six-engine B-36 with full equipment and 10,000 lb. bomb load is reported to reach at 375 mph top air speed. Jet-powered B-52s have a top speed of 415 mph. Swept-back of the outer wing panel plus tractor-tail turboprop engine installations will increase performance of the bomber to an expected 500 mph. This changes the present black outline from 49 to 37. Eventually USAF hopes to fly 590 mph, at 55,000 ft. Meanwhile Consolidated Valves Air-

craft Corp. delivered the first RB-36 reconnaissance bomber to USAF's Strategic Air Command. Placed at one of 21 B-36 bombers being converted to B-52s with addition of four jet engines along its pods under the wings.

With the installation of high altitude engines equipment in the forward bomb bay at "A" area are being converted to RB-36 aircraft. The modified bomb bay contains 14 high altitude engines including one with a 46-in. fuel length test. The engine current laboratory is said to be the largest ever designed for one plane.

Strategic Air Command currently has three reconnaissance bomb wings two of which are scheduled to receive RB-36 and B-52 aircraft. The third will be equipped with Boeing RB-36. Presently of these wings will be operational with B-52 Superfortresses (Avrocan Wings June 3). By 1954 SAC will acquire a third RB-36 wing.

USAF Orders—USAF has J17 B-36 bomber on order with approximately 120 already delivered to SAC. Of the total number of B-36s on order, 60 will be at the "RB" type and the remainder will be at the "B" type. This will give SAC an overall strength of three 30 plane reconnaissance groups and four bomber groups of the B-36 type. The rest of the planes will be open to both the RB and B groups.

RB-36As have been undergoing company sponsored flight tests for the past six weeks. The first RB-36A, which carries the same standard defense armament—16 20 mm cannons—at the B-36 bomber, was delivered to the 28th Reconnaissance Wing at Royal Air Force, Farnborough, England, in November 1948. The B-36A will be delivered between the 28th and the 55th RB Wing at Farnborough AB, Calif.

## Financial Aid Asked For Foreign Plants

The Administration is pressing Congress for new authority in wartime surplus disposal. The latter was granted in Western Europe, England, and Canada for increased output required under the North Atlantic mutual defense program.

An industry questionnaire to Avrocan Wings Inc. that the most of its other would not look out making business for B-52 plants but would deprive them of potential future business.

Program Outlined—The program outlined by defense ministers at The Hague to build Western defense would establish a single defense "force" instead of separate defense forces. It would call for increased defense spending down the line by the 12 North Atlantic nations, with the U. S. assuming the lion's share of the burden. The program will not start before fiscal 1952.

A similar Truman-Johnson move last year to spur war production ahead was knocked down in Congress. In the H. 3-billion 1950 fiscal year Arms Act Authorization Act, Congress prohibited the use of funds to stimulate foreign war plants. The act ban the use of defense aid "to construct or aid in the construction of any factory or other manufacturing establishment outside of the U. S. or to provide equipment or machinery . . . for any such factory to delay the cost of maintaining any such factory . . . to make any payment in the form of a bonus, subsidy, indemnity, guarantee, or otherwise, to any person or such factory . . . as an inducement to the construction or the mass production of arms, munitions, implements of war (etc), or for the construction of any prison for . . . persons trained in or for any such factory . . ."

President Truman and Defense Secretary Johnson have urged that this provision be stricken out of the \$1.2-billion arms and munitions for the coming year, now pending in Congress. Truman said that the act "helps our partners to help dollars spent on plant equipment which would make possible at least four different words of financial equipment."

That the act effect would be elimination of tactical surplus production in Western Europe and England. Under the "single force" plan, these countries will assume more responsibility for ground forces and tactical aviation support, and the U. S. will concentrate on strategic support.

Over the last few months of the 1950 fiscal year, Johnson reported, the U. S. will supply other North Atlantic Pact nations with the 165 military aircraft under the Arms Act Program. Although the program was authorized last October, defense preliminaries prevented the flow of supplies until January of this year. With the proposed 1951 fiscal year program, the new law, it is expected that the supply of military aircraft over the coming year will approximate that year's supply.

The President and Johnson also asked for a loan to sell war supplies to foreign countries under the 1950 fiscal year program, when they are limited to members of the North Atlantic Pact and the Hemisphere Defense Pact.



HANDLEY PAGE H.P.R. 2 solo by itself, all-metal construction train combines slow starting speed and quick climb characteristics.

## British Trainers Vie for RAF Bid

Perceval P.56, Handley Page H.P.R. 2, both all-metal, use Armstrong Siddeley Cherub 17 radial engine.

London—Perceval Aircraft Ltd and Handley Page (Bristol) Ltd are engaged in a two-sided competition for RAF trainers with new designs of a four-engine, all-metal, all-metal construction. The two entries:

► **Perceval P. 56.**

► **Handley Page H.P.R. 2.**

Both planes are built to the same Air Ministry specifications, issued last September, which means both designs train for night flying, training on ground.

The competition is for a two-seat, piston engine trainer of improved performance over the Percival Perceval, the present RAF four-engine trainer. Both entries are low-wing monoplane of rugged, all-metal construction. Both are powered by the Armstrong Siddeley Cherub 17 engine, a radial six-cylinder piston type of 120 hp. The Cherub engine has been used for many years in two-seater, four-engine planes, notably, the Avro Anson and the Avroport Chalkie, but said now it has never been widely used in single-engine aircraft.

► **Perceval's Project.**—The Perceval P. 56 is a four-engine plane (Avrocan Wings June 2), called by a prominent design firm as a low-wing monoplane and a four-engine trainer. Plans and handling characteristics are said to be very similar to the Avroport Chalkie and a high rate of climb are expected.

In its construction special care has been taken to keep the P. 56 simple and capable of being maintained by unskilled personnel without aid of special tools and with the minimum of ground equipment. Normal maintenance of

both engine and airframe, it is claimed, can be performed from the ground, from outside the fuselage and cockpit. Two-stage under-cowl canopy access for night flying training is fitted.

► **Handley Page's Hope.**—The H.P.R. 2 is the first design to come from the Reading subsidiary of Handley Page since the purchase of the former Miles Aircraft Company. It was named for the company by the well-established bomber builder at Crickhowell. It is worked by a four-cylinder, four-cylinder engine, and a four-cylinder engine extending all the way forward to the back of the cockpit assembly.

First flown late in April, the H.P.R. 2 is said to have very low starting speed and quick climb characteristics. A sliding canopy encloses the crew and gives excellent all-round vision. Adequate protection in the event of a crash, comes from a strong arch above the wing.

The H.P.R. 2 is designed for fast production by the use of light construction methods and almost conventional equipment to be constructed as easily as any mass-produced jet.

Maintenance is aided by the aircraft being split into numerous components easily replaced or changed during in-flight service. The entire cockpit can be inspected and maintained from the ground, through floor panels.

Both trainer projects will be given extensive testing by the RAF before the final decision is made and a quantity order is placed.

► **Solely Side.**—The design called for a side-by-side seating arrangement, which the RAF likes. This has also been included in the design requirements of an advanced trainer, the plan for an earlier competition between the Avro Anson and the Percival P.56. Both projects. These two types, usually laid down and flown with turbo-prop engines, were later tried out with piston-engine installations. After extensive testing, Reading-Percival's Percival P.56, with the Rolls-Royce Merlin 35 piston engine, got the production contract.

## 'Cupola' Will Test Europe's Air Defense

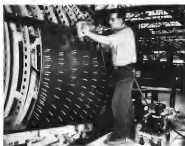
London—Armstrong B-29 bombers will join the (modified) air force of the Western Union nations—Britain, France, Holland and Belgium—in Europe's "Cupola," a two-day test of Western Europe's air defenses in August.

RAF and United States bombers will play the role of the "enemy," with RAF Meteor and Vampire jets and warships equipped fighters from the other countries co-operating with the anti-aircraft batteries in defense.

The mission will be under the general direction of Air Chief Marshal Sir Lewis Robb, Commander-in-Chief, Air Forces, Western Union, who will not only be attacking and defending forces. The duration of the defending force will be extended through the national or defense commander, and the detailed planning and coordination will be carried out by a small staff of officers from the headquarters of Air Forces, Western Europe, at Fontainebleau, France.

This will be the first combined air exercise to be held on the Continent.

## PRODUCTION



SKIN TRIMMING SAW being guided along flexible track fitted in B-47 fuselage jig

### New Saw Speeds B-47 Skin Fitting

Boeing-developed time-and-labor saving device permits on-the-jig cutting to very fine tolerances.

A new power trimming saw developed by Boeing Airplane Co. has speeded up production of the swept wing B-47 Strategic bomber while dictating an extra simplicity bonus in providing very closely beveled body skin joints.

The tool is the key to a new time-and-labor saving production sequence on the half-spanned wing bomber which also permits use of less highly skilled workers.

Until the Boeing B-29, body skin joints were simply lapped about 1 in., the average skin thickness of 0.40 in. creating an interference problem in lapping. On the B-29 and B-50, thicker body skins of 0.50 in. and more required beveled joints but a liberal tolerance of .032 to .064 in. was allowed between skin edges.

With such a tolerance, fitting of the skin is not difficult. The skin sheets are cut to approximately the correct dimension—a little large all around—then placed on the framework, scrubbed, taken off and cut with the shaver.

► **New Problem**—In critical areas of the B-47, however, joint tolerances have been reduced to .005 to .015 in. where the body skin design is thickness up to .250

The shaver cannot be used as such since, because it is nearly impossible to hand-cut dual skin thickness and because shaver cuts are not accurate enough to meet the desired tolerances. On the new prototype B-47 and first production model, power shaver and cut wire used, but the shaver still had to be taken off the framework for cutting. Much time-consuming filing also was required.

Boeing's answer is a 17-in. circular trimmer saw that runs on a flexible steel track, and is driven by a 11 hp air motor. Its blade is set with tungsten carbide teeth which do not gum up with dust as does the ordinary high speed cutter. The steel track may be integrally fastened to a job. Or it can be wrapped onto the cylindrical surface of the B-47 fuselage and held there during a cutting operation by boom-type Neoprene suction cups designed and manufactured by Boeing.

Latent accuracy of the saw cut is controlled by the lateral rigidity of the ultraresilient track. Degree of the set is regulated by a guiding wheel whose edge rides on the skin about 1/4 in. to one side of the saw blade. This wheel turns on a bearing whose bore revolves

on the saw blade shaft, but whose outside bearing surface is concentric to that shaft.

Cutting depth of each saw is adjusted and locked so that it will cut to within approximately .005 in. of the thickness of the skin upon which it is used, thus permitting the cutting of one sheet stop another without altering the lower sheet. As the saw teeth are ground at a slight bevel, the waste portion falls after the sawing starts off, leaves a very slight burr-edge.

► **B-47 Setup**—In applying skin to the B-47 fuselage, the first sheet is riveted so completely and permanently. Then the saw is run around the edge and the waste drops torn off. The next sheet, its edge lapping slightly over the first sheet, is riveted a few inches back from the edge of the first sheet. The saw then is set over the second sheet, along the lap edge. When the saw cut is made in the second sheet and the waste portion is removed, the edge of the second sheet snaps down into place, butted against the edge of the first sheet.

Routing then is completed on the second sheet and its remaining edges are sawed. As rivets are driven along the beveled edge, the skin expands slightly and is thus fitted to the edge of the first sheet, usually to a very fine tolerance. Successive sheets are applied in the same manner.

The skin saw also is used for cutting door and window openings, where tolerances are small. If it is not used on the B-47 wing, however, where dual of greater thickness is applied.

## PRODUCTION BRIEFING

► **Mississippi-Rosenzweig Repulsion Co.** is starting construction of a building in Mississippi to house its aviation engineering department. Occupancy is expected this November.

► **Northrup Aircraft, Inc.** has arranged a long-term lease of facilities at Oniz International Airport, Los Angeles, to expedite production flight testing of F-70 Scorpion all-weather fighters.

► **Lock Metalrol Co.** has moved its headquarters to 708 W. Michigan St., Milwaukee, Wis.

► **Glenn L. Martin Co.** will shut down its plant from July 29-August 13 inclusive for the company's annual plant-wide vacation period. Only a few dozen of Martin's nearly 9000 employees will remain to handle maintenance and similar work.

► **Johnson Aircraft Co., Tyler, Smith County, Tex.** has been awarded a contract. A contract meeting is scheduled at the U. S. Court House, Tyler, for June 11.



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Placing a tight formation of speeds as fast as sound calls for extreme precision on the part of today's jet pilot. But in jet flying there is more precision than meets the eye! For instance, keeping a gas turbine spinning at rates as high as 48,000 RPM requires bearing tolerances measured in millionths of an inch! At Bower Bearings—because they are the finest precision bearings made—are used by nearly all manufacturers of jet aircraft engines. Pratt & Whitney, General Electric, Westinghouse, Allison, etc.—all have found Bower Bearings thoroughly capable of standing the roughest speeds and temperatures as common in jet engine operation. New materials pioneered largely by Bower have proved more than equal to temperatures up to 500° F. And Bower bearings operate with complete efficiency as a "maintenance-free" lubricant. This is an excellent example of the high performance of Bower bearings in the aviation industry—bearings that are outstanding for precision, durability and quality.

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approach, requires complex requirements and approach visualization.

Sproy details approach visualization as the "primary by which the pilot views, in his mind, the position of the aircraft with respect to the runway, especially its displacement of the centerline in terms of elevation or not and the wheels will be on the pavement when crossing the threshold (end of the runway). This term does not include the visualization of aircraft altitude which is generally conveyed symbolically by (1) the green horizon, (2) etc."

► **Chapter Requirements**—Fully automatic and Zero Reader couplers need to be adjusted to operate in a center range of deviation uncertainties. If the localizer deviation uncertainty is above this range, the coupler may cause the aircraft to bank, and if below, will produce slow "beam" response.

Mixed conventional goes little performance change over a wide range of localizer uncertainties. Therefore, in order to operate with optimum effectiveness, the new coupler requires that "the distance deviation uncertainty at some given reference point in the landing area must be maintained to a tolerance, regardless of site or runway length."

► **Approach Visualization**—During an instrument approach, it is of greatest

importance that the "deviation indicator" be enabled for the pilot to focus an accurate mental picture of his displacement with respect to the runway. The main accuracy of the visualization, the more the number of visual approach, since the pilot will see what he expects in the proper perspective, as he makes the transition from instrument to cockpit light.

As accurate visualization is critical to the pilot's confidence and a final proof of "fly-by" ball out the window and ball on the ground" is only to become accustomed.

An accurate environment is also necessary before the transition begins. Should the aircraft... be in a position with respect to the runway from which transition would be hazardous, the pilot should always be able to evaluate the situation and take appropriate action. This is the "go-no-go" function of the ILS deviation indicator which is vital to the safety of any low approach.

The pilot must be able to judge magnitude of site or length of the runway, whether or not the aircraft is over the runway.

"If the requirement is to be met, the localizer requires deviation sensitivity must be adjusted for each particular site."

According to the Sproy report, in

order to meet these requirements, the localizer transmitter must be capable of adjustment from 1.7 to 5.5 degrees, which may or may not be possible depending on the type of equipment that is used.

Length of ground CAA lookers range in value from approximately 4 to 7 degrees.

Sproy strongly endorses the Colson sphere of runway distance indicators, runways, and center and border line demarcations.

These markings enable the pilot, after achieving control light, with the final reference guide he needs to complete a safe landing. These are how far down the runway he is, how well he is lined up with the runway, and his displacement from the runway center line.

For people who have difficulty it is to distinguish between runway and adjacent terrain under poor visibility conditions unless the runway border is clearly delineated.

Sproy started with the development of a semi-automatic approach coupler and terminated with a comprehensive evaluation of approach needs as applied to the ILS system, all with a view to making instrument landings safer and lowering acceptable flight minimums to an irreducible figure.

## NEW AVIATION PRODUCTS



### Brightness Control

Type GCRH brightness control regulator with high speed switching, is for use with direct current lighting systems.

Driver developed by Hewlett-Packard Co. controls brightness tips to be switched at high speed under load. This eliminates "flicker" that occurs during switching with methods previously employed.

Unit is designed according to CAA Specification 1.518. It consists of a static type constant current regulator and brightness controls mounted in compact unit. Switching operations are used to be precisely maintained and are accomplished by means of standard 60Hz switches.

Regulator is designed to operate from 240V, 50 watt and is made at four sizes: 7.5, 15, 30 and 35W. Output ranges are: 85 hp, 6.6, 84 hp, 3.2, 81 hp, 4.1, 82 hp, 1.4, 81 hp, 2.8.



### Hydraulic Jack

"Go-Jack," new foot-operated hydraulic pumping device can be used with nuts and other parts for assembly and disassembly of large parts, from blind parts and other machine shop applications.

Made by Wittek Industries, Lewis St., Easton, N. J., now develops up to 20 ton pressure. Manufactured from compact box, high pressure range and

simple operating features make it comparable in performance to existing pressurized hydraulic jacks, but less expensive to buy.

Pumping and releasing phases of operation are under foot control at all times, leaving operator's hands free. Unit has two sections controlled by selector valve. When selector is "out," foot pedal forces can act quickly until work is completed, and then automatically changes to low speed to take advantage of full ton capacity. For light work, selector valve can be set to "in" position to operate pressure constantly at high speed.

Pumping rate can be controlled to 4, 10, and 20 tons per minute standard, by means of reversing flow. This gives user a wide range of tonnage capacities.

All controls are on the device. Cuts thread operation will not damage and other measures height of unit is reached. Body and foot pedal are aluminum alloy castings. Total weight is 10 lb.

### Small Converter

New 84-cc, 480c converter permits saving in space and weight. It is designed for high-altitude operations in various electronic and electrical equipment and is also maintenance for aircraft and guided missiles. Brown Instruments Division of Minneapolis International Corporation, Co., Wayne and Roberts Ave., Philadelphia, is maker.

Device can be used with any optical switching conversion of low-power direct voltage signals as low as one microvolt to 1000 alternating voltages. Unit is available in a single pole, double-throw, quadrupole switch, actuated by a coil-driven solenoid coil.

Converter is housed in dust and moisture-proof case. Leads to make unit can be connected to plug on side of cover, with mounting connectors made through a top opening. Mounted into hole socket. Converter measures 4 1/2 x 1 1/2 in. and is designed to operate continuously for more than 500 hours without requiring adjustment.

Other specifications are: Driving rate, 400-4000-100, 94 mil/second; 400-4000-100, 94 mil/second; 400-4000-100, 94 mil/second; 400-4000-100, 94 mil/second. Switching action—each contact closed 50 percent of each cycle, contacts maintain 5 percent of the time, twice each cycle. Symmetry—within 5 percent. Load characteristics—resistive or inductive.

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# AERONAUTICAL ENGINEERING

## Engineers Advance Turbine Aircraft Data

Technicians at IATA symposium offer details to help airlines make true evaluation of future transports.

By Irving Shuster

Manufacturers of engines and airframes for turboprop and turboprop aircraft are accumulating valuable data for the airlines, to bridge the gap between basic transport pricing and use in regular service.

Some of this information was recorded in American Week's initial report (May 29) on the International Air Transport Ass'n's recent turbine-powered aircraft symposium. There are more factors the engineers and operators will have to consider.

► **Reverse, Fasten**—Present length runways should present no problem for turboprops or turboprops with use of subsonic aircraft.

Advantages which might be gained from a wing start would not seem to justify redesign of runway layout. It is not possible to take a wing start into the runway and the wing speed was 20 percent of takeoff speed. It is estimated that only 4 percent of runway length could be saved.

Since temperature will be an important factor in turbine performance, manufacturers will have to be made with greater care. These taken on the concrete runway probably would give an considerably variable time. These recorded at usual airport locations. Studies are now being conducted on different values, and results will be recorded.

► **Debris, Water**—Debris on runways and spray also will pose a problem. The Air Force reports that foreign matter taken into the engine air inlet has damaged compressor blades. Higher shock may increase this problem.

One manufacturer ran a 1.5 percent drop in power was expected according to type of material ingested. Rolls-Royce figure was about 2 percent.

Others feel that there should be no difficulty if it is not present on surface to cause sticking of foreign matter.

Experience with runway spray and water runs. That with the jetliner is significant because this exists presently has the lowest air intake. Also reports that very heavy shock was encountered but none was taken into the engine.

Rolls-Royce feels that water ingestion is no problem. Bristol experienced no trouble in commercial use, nor has the USAF.

However, one manufacturer reports that with an inlet 10 ft above ground level a puddle of water was 100 ft into the inlet at a short. This type of condition might possibly occur on the engine.

Concerns on effect of sand ingestion is that sand should present little difficulty, although there are contrary opinions. The Air Materiel Command has conducted turboprop engine sand tests which have indicated an rapid or poor deterioration, but nevertheless something further serious study. (Aviation Week, Dec. 3, 1960)

► **Soots, Haze**—Airport sootiness will have to be considered. Effect of oil and dirt substances on exhaust on airport buildings depends on particular engines and type of fuel used.

Some technicians said it wouldn't be advisable to run the engine on asphalt. The Air Force has had bad experience with the material type of surface, reported had dropping leading to deterioration. (Aviation Week, Dec. 3, 1960)

Being said that at present level, the hottest point of the jet pipe is at about 40 ft, where temperature probably is about 250 °F, and exhaust is about 175 °F. At about 100 ft all of turbine, temperature is 100 °F, velocity is 70 ft/sec. Area engineers say there is no particular heat problem with jets on the ramp. They say they "haven't started anyone yet."

The Air Force feels that noise at ramp jet thrust on the ramp will be a troublesome factor. However, the jetliner in the recent accident of its destruction at the New York International Airport was not damaged by noise. And a turboprop is said to give approximately less noise than that experienced with an equivalent piston engine plane.

► **Crew Data**—Flight crew requirements for the typical low-engine turbine craft should pose no problems.

For the turboprop, the need for a flight engineer should be no greater (probably less because of lower maintenance) than on a piston-powered plane. And a turboprop does not require a flight engineer necessary for their turboprop.

Crew qualifications, physiologically and training wise, should be no different

for high altitude turbine planes. Recent reports that C-97 crews are being used in B-47 operations with an difficulty.

► **Reserve**—Maintenance or replacement equipment probably will be no problem within operating limits of commercial turbine planes. Reliability of most units has been improved up to 10,000 ft. Though aircraft has caused some trouble in military operations, fuel flow meters should present the

Reserve should not be a troublesome factor at 25,000 ft. The Desert Vixen in the jetliner have been reported to run on time up to 15,000 ft without use of the reserve. And Bristol reports running at more than 20,000 ft with turboprop wing-ditching.

Reserve is not greatly advisable at high altitudes with a cold engine, the plane should be brought to a lower altitude, for this will give a higher ambient temperature, allow oil to thin and engine lubrication if this is trouble on this note.

An electric type starter probably will be sufficient for commercial turbine craft.

► **Configuration, Power**—Lift-Vue mentioned for specific fuel consumption for the centrifugal turboprop was 1.42, and about 96 for the axial, but there is a need to achieve that lower figure have been obtained.

Optimism generally prevails for at least improvement in fuel consumption in both the axial and centrifugal types.

Turbine acceleration characteristics are considered satisfactory to execute around airport procedure. No trouble was reported for either the turboprop or turboprop.

Variations between power output of turbine engines is considered slightly larger than for piston engines.

The Bristol engine a power output variation of about 3 percent, General Electric about 2 percent, Allison about 4 percent.

In all cases, power service loss (perhaps about 2 percent because of dirt collecting, etc.) has been corrected with a subsonic wind tunnel through the engine. The axial type may be more sensitive to service loss than the centrifugal.

► **Wheel**—Overheating is a liability that bleed air will be used to provide landing gear wheels.

Frank, Chester, Bristol's engine division chief engineer, says he has seen that "compressed air isn't free." It

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based on wind only part of the time, it covers all the climatic little things the designer has. Apparently, it is not advisable to build the manufacturing structure.

The Air Force has studied the general protection problem for years at Wright Patterson AFB, and has found it unperturbed from point of view. It does not consider it a severe problem, hence not too important.

One definite report came when protection was satisfactory in that it gave heavy vibration.

► **Tearing.** Obviously, fuel consumption will be an important factor in timing and airspeed check, particularly when a full tank is needed for the trip.

ACA feels that manufacturers should not include fuel or air speed, but rather, include an average ground consumption and let each airline handle its own specific problem. It feels there is no overall answer to the problem.

The Handford reported 13 gal./mi. consumption while being at 30 mph. Revised over a low altitude condition (from which pilot would not accelerate rapidly) using about 10 percent of full load consumption.

Cockpit and instrument checks could be made while tuning to runway.

Some feel that at a busy airport, the plane might have to be forced to a waiting apron to use fuel. BOAC thinks trying to runway would be too slow. Trans-Canada Air Lines also feels that having a tail section. With towing, checks would have to be made at the runway.

► **Starting.** Trans-Canada gear starting time at about 15 sec., CRJ and Airbus about 25 sec. All four engines on the jetliner not started in less than 1 min.

Also Canada technicians hold that are possible for a 10-sec. clearance (from start to takeoff) (no time here held) in by far average.

Time for the Vindicator to start was given as 2 min., 17 sec. with 1 min., 30 sec. as full time from start to takeoff. Correct time to takeoff was put at 5 min.

Boeing helicopters 40-60 hp to start some of the large engines.

For starting a large number of planes, a permanent installation may have to be used to supply power rather than using a start service.

► **Altitude Factor.** The Air Force does not feel that need for variation in engine altitude to avoid storms and rough air should present much difficulty because the craft is over most of the weather at 30,000-35,000 ft. Thunderheads are not so interesting at this altitude and the craft can be diverted around them at change altitude only a little.

St. Robert Watson-Watt indicates that the higher the altitude brings the

craft over the weather about 50 percent of the time, and when a considerable amount of time is necessary it doesn't mean into 50 percent of the weather troubles encountered at the lower altitudes for conventional craft (weight of an acceptable scheme may be cloud turbulence detection would be 50-100 ft.).

Using a climb procedure to avoid turbulence areas will depend, to some extent, on reliability of the pressurization system.

► **Consumption Change.** De Havilland reports that a 2500 ft. change from optimum cruising altitude gives a change in fuel consumption of about 7 percent.

ACA says that if the craft goes from 30,000 to 25,000 ft., economy will be 71 percent; to 20,000 ft. will bring a 15 percent increase, whereas a climb might make no difference.

Boeing reports that a drop from 40,000 to 30,000 ft. would give a change of 14 percent in miles per pound of fuel.

Figure advanced for the Vindicator in going from 30,000 to 25,000 ft. a 15 percent increase.

Rolls-Royce's L. G. Dawson said that when flying at a given IAS at 40,000 ft. to obtain 500-mph. TAS, the same IAS at 30,000 ft. would give 400 mph. TAS. This means that if there were a 100-mph. headwind at 40,000 ft., you would want to have an headwind at 30,000 ft. to get the same ground speed.

► **Pressurization Problem.** Range for rate of climb recent was mentioned at 200-300 fpm. for descent, about 200-300 fpm.

Chrysler cabin is pressurized at 8000 ft. at 40,000 ft. Jetliner at 2000 ft. at 25,000 ft., 4,000 ft. at 30,000 ft.

Danger of blowing a door at high altitude would undoubtedly be a serious factor, whereas popping a window might not be too serious. The probability being that the condition could be "right up with" at a lower altitude.

Cabin doors open inward. Thinking in that all doors should open inward and not with pressure. Some feel that sliding doors would afford more space.

It is believed that a very high factor of safety will be needed for plastic installations for high differential pressures in pressurization. One airline technician advises elimination of windows, possibly using a moving transparent material.

But others feel that attainment of safe windows will contribute no problem.

Military view is that it may be advisable to present the cabin separately from the flight compartment.

► **Oxygen Supply.** Oxygen supply will have to be immediately available, for it is reported that at 35,000 ft. useful consciousness is only about 25 sec. at 20,000 ft. about 1 min.

One observer feels that unless the mask is being worn, it is not worth



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be precluded in high-speed aircraft. Perhaps special equipment will be needed—such as a "cone" over pilot's head, giving him a blast of oxygen as it is pulled down.

► **Milestones, Ltd.**—For the turbo-powered engine, the theory essentially is that there will be fewer parts to consider than a piston-engine type.

Loss maintenance should be kept exceedingly low, and it is estimated that overhaul and materials cost will be about half that required for a high-power piston engine.

Figures given for the Dart are 1 maintenance hour for the 25-hour check, 8.4 for the 50-hr., 3.3 for the 200-hr., and 51 on the 500-hr. check.

British uses largest compressor life in 300,000 hours and longest life on engine is 750 hours to date.

► **Fuel Data**—British runs a new smaller dash type in a comparable piston engine and can build weight about 10-20 lb on the turbochargers. It is said that there is no indication that a greater degree of balancing accuracy is necessary for the turbochargers. To go to higher speeds, however, some feel that the propeller will need dynamic balancing.

Engine and propeller controllability for the turbochargers is now satisfactory for commercial operation.

► **Engine Pods**—The pod will be another turbine engine consideration. Though originally adopted because of the problem in locating the engine in the wing in high speed flight, other reasons were purely do and.

It allows air maintenance access to engine, facilitates change procedure, and isolates engine from wing in event of fire.

Spacing between pod and wing is not considered as important as its position relative to the wing.

Commercial version of the B-47 probably would not have pods so far out on the wing.

► **Fuel Factors**—British's Frank Ocker fault that adoption of kerosene as turbine fuel, instead of gasoline, is one of the biggest steps in the direction of passenger safety.

While it is a safer fuel, it cannot be considered a silver bullet. Fuel speed with kerosene is relatively low. With a high gasoline fuel, the sudden intake of CO often breaks out the passengers, whereas with kerosene they may have the chance to wait and sleep.

It is reported to give 10 percent more air miles per gallon and after no heating difficulties.

Freezing point, however, is -60F. at against -60F. for gasoline. One solution offered is to connect the relatively high freeze point it to absorbage the oil cooler in the tank to mix fuel temperature.

Airlines would not want tanks in

the fuselage, thus being restricted to areas beyond the wing root.

► **Unburned**—These present unburned waste goes by values for piston engine fuels. EAL, to 10 lb./day (that is an average indication after a reasonable development period), AOA, -4.3 lb./day (in two-Alastic seven), TWA-12 lb./day, HRA-6 lb./day.

It would appear that unburned for the turbine-powered transport will run 6 to 10 lb./day for most airlines. However, EAL feels that after a reasonable familiarization period it would expect 14 to 16 hours efficiency because of the high initial investment and inherent structural impedance of the high speed turbine transport.

► **Conversion**—Adaptation of existing transports for turbojet engines is not considered feasible.

But change to screw-driven turbo prop is not deemed a major problem. For this alteration the craft would require a reasonably high critical Mach number, penetration, and structural strength.

It is felt that last present day designs will fit these requirements—Cessna CV-240, Boeing B-377, Douglas DC-6 and Martin 4-34.

## Surfacing Material Resists Kerosene

The harmful effects of kerosene-type jet engine fuel spilled on runways are minimized by a new surfacing material developed by United States Rubber Co.

Called Aero-Seal, it is a solvent-resistant rubber compound which can be mixed with tar to subside the dissolving effects of this type of fuel. The compound protects bituminous pavement and tire-exposure joints in concrete.

U. S. Rubber points out that damage caused by kerosene fuels has become a major problem because of their lower rate of evaporation compared to high octane gasoline. During normal operation, spillage from one jet plane may amount to five gallons before takeoff.

Continuation of this problem was taken up at the recent 10th Symposium of the IATA Technical Conference at Albany Park, N. Y. (see page 27).

The conference at that meeting was that it is undesirable to run up jet engines on asphalt and that even the operators have in concrete may give trouble. The new compound may alleviate these difficulties.

At present, the dissolving effect of kerosene fuels eventually strips the bituminous surface, leaving loose or flake aggregates. Repaired asphalt acts as progressively lower level with further deterioration taking place from weather and traffic. This creates an additional hazard, especially for jet planes.



### QUESTION:

Why do thousands of Southwest flyers stop at SAC service headquarters every time they get out of their seats to do it?

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## Let's Sell Today's Planes Today

Critics could legitimately show the real utility of present craft instead of common negative sermoneering.

[illegible]

Used properly, with few exceptions, the negative element has been contributed by writers with limited contact with nature and its complex biological problems.

These were those who, misguided by the industry's own overstatements, found they could not afford to buy a power "house on wheels." Others bought the product in their night or second car, a defuncting machine or a station picture projector without first establishing a family need for its function. In either case, their group had a good base for dissemination with the industry's promotional effort which created their disposable mass. Unfortunately, the vocal and literate criticism was directed, without qualification, toward the product. It seems that we all assumed that the second carline would

### The Author

Eugene W. Norton has served such functions to diverse organizations. He formerly was Technical Director of the Aircraft Industries Assn. and then there went to Laminar Airplane Corp. as vice president-engineering. The successful design of the Laminar Sedan was very much his doing. Later he was Washington representative of Flight Safety Foundation. Now he is a *Corpus Christi* star of San Antonio, Texas.

somewhat achieve general acceptance without entering the evolutionary process he tentatively associated with mechanical development.

► **S&M Out:**—It was concluded that the post-war airplane was "an expensive" and that it had no "utility." In a very short period of time, due to the effect of this reaction, the military branch had sold itself out of business. By 1945 the military had generally accepted this conclusion and had consented almost to resign itself to develop the legalistic economic order that is business as usual.

There is a growing type of criticism which, though inherently correct in many respects, is confused in character and tends to be concentrated solely on a consideration



are businessmen

*COLD-  
BLOODED?*



**OF COURSE NOT!** Literally, their normal body temperature is 98.6—same as laborers, engineers or any other group of people. And, figuratively, they're no more, or no less, cold-blooded—as a group.

We all know unreasonable generalizations can be dangerously false. Common sense and on-the-job experience show us the value of dealing specifically with ideas, problems—and people.

Let's not make the big—and costly—mistake, then, of generalizing on religious or racial groups. Adopt and carry out these common sense principles:

1. Accept—or reject—people on their individual worth.
2. Don't listen to or spread rumors against a race or a religion.
3. Speak up, wherever we are, against prejudice. Work for understanding.

*Published in the public interest by:*



McGraw-Hill Publications

## 1940—Comparative Analysis—1950

### Conventional 2-place Personal Aircraft

[illegible]



## How to supply dry, clean sea-level air to electronic installations at 50,000 feet

The electronic equipment of today's high-flying aircraft must have dependable protection against the hazards of fluctuating orders for the few parameters of the upper air. LEAR/ROMEC compressors will maintain 10 to 100 absolute pressure from sea level to 50,000 feet, and some positive starting in a temperature range of plus 160° F to minus 32° F. The pump illustrated above (USAF type RD-6/U) may be used for continuous or intermittent operation. It runs dry—requires no lubrication—thus eliminating all possibility of undesirable oil vapor. It will serve dependably for 1,000 hours with no decrease in installed performance. Full engineering specifications and test reports are available upon request. Bring your pump problems to LEAR/ROMEC, specialists in the design and manufacture of precision aircraft devices for over 20 years.



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also incorporated into makes electro-mechanical control systems, actuators, gas flow controls, valves, bellows, aircraft cables and electronic wind-up controls.



Why due report to that column? I suggest that he open his eyes to the facts and flush the corrupting poisons of pressure from his mind. Shifting the very essential accomplishments of the past decade does not provide a very sound basis for healthy progress in the future. It is particularly deleterious in personal aviation since it tends more to neglect the money pinpoints and constantly occupied area of the aircraft product.

► **What Utility Means**—I wonder how many of the editors appreciate the Webster definition "utility" not merely as usefulness, but as "conducive for some desired end." Thus, the question of the modern airplane utility must be discussed in relative rather than absolute terms and then only with reference to some "desired end."

Mr. W. T. Pope, Jr., one of the industry's strong figures, eloquently stresses this one of the personal airplane's utility by comparing it to a pick-up truck. For the average family an absolute pick-up truck has little utility and its cost would be prohibitive for the "house brand." To a plumber, however, a good mechanic, it would also have utility at a moderate and easily payable cost.

Similarly, to the average family with limited requirements, any aircraft would be an expensive and relatively low utility vehicle. On the other hand, for those with certain types of travel requirements, the modern personal airplane is the most economical, comfortable, safe and useful method of transportation. In fact, many modern suburbanites, merchants and others who have taken to the air, report that their airplane is their most valuable home machine.

Since progressive product development in any industry depends upon acceptance and use, it is logical that any factor which so fully restricts acceptance and use will retard the pace of development. If the editor would conscientiously consider the many, commonly useful applications of the personal airplane they might gain a new appreciation of its importance today and its capacity for greater utilization through its development.

► **Today's Airplane Today**—Turning their literary and word talents toward publishing the merits of today's product, the editorial board could benefit a considerable amount as the industry's effort to find some of those on a problem is in today's airplane today.

Research comparisons within the industry would speed up the actual evolution of tomorrow's airplane. The pattern of today's air is known and proven. The expansion of aircraft applications is a matter for the entire industry and aircraft sales often.

Despite the critical clasp of European leadership in lightweight design, the fact remains that the U. S. product is the only one which has secured any international acceptance whatever.

The current U. S. personal plane industry produces a plethora of models which offer greater air transportation value than it has ever been offered by any other air transport industry in the world. The time has come for the industry to recognize this fact and to apply for a job on the main which is working with confidence and determination for the advancement of aviation through the free enterprise system.

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## AVIONICS

### Need Improved ILS Monitoring

Pilot calls for fully automatic monitors checking the entire approach course to remove present weaknesses.

The following is a "change of pace" in *Airline World's* aviation reporting. It is presented because it puts a senior problem up to the aviation professionals and experts. I don't see a theory, but an first-hand experience. The editor is an American Airlines captain. —ZB

By R. C. Holman

Airlines and pilots are reporting increasing concern over the reliability of the Instrument Landing System.

Sure and substance of the problem is that two safety features are needed to meet reliability of ILS.

- Fully automatic monitors.
- Installation of a monitor at a point in the approach area which will check the localizer accuracy along the entire approach course.

Some recent instances show what is occurring the airlines and pilots:

- A DC-8 makes an ILS approach at Chicago. The cockpit instrument shows the step 400 feet high during the approach. GCA shows the light at 400 feet low during approach.
- A DC-6 makes two ILS approaches at Buffalo, takes a perfect go according to cockpit indications. Both times the pilot backs out of the overcast too far to left of the runway to make a landing. At the boundary a passed the indicator swings to left half position. Monitor in the tower shows the system is functioning correctly.
- A DC-7 crashes in the Potomac while making an ILS approach at Washington. National Airport. Reason "as known" is data.
- A Martin 2-4-2 crashes nearly a mile from the airport at Minneapolis while making an ILS approach. Reason "as known" is data.

The Instrument Landing System consists of two transmitters—one for the runway localizer, the other for the glide slope. The receiver for the localizer is located 400-2000 ft beyond the ground end of the approach runway. There is a monitor component "pick up" end 150 ft in front of this and another is located 55 degrees from the runway axis. When significant deviations occur in the beeper up to this point, the monitors act as a warning system in the control tower. The operator then

shuts down the system or switches to standby equipment.

Accuracy Challenge—The accuracy of these monitors has been challenged recently by both airlines and their pilots. Radio waves are subject to noise interference which may cause them to deviate from their prescribed course. Because of these facts monitors are provided for all commercial radio installations to provide warning of deviations from course.

Type and location of monitors are of prime importance. There are good monitors and bad monitors. One that is not completely trustworthy is worse than none at all for in an emergency are always subject to misinterpretation.

The airlines learned long ago that manual warning systems are only as reliable as the human operator. The automatic check signal system was designed to eliminate human error. Safety records of lines equipped with this system have proven its worth. But many automated warning systems are still unsafe.

With the increasingly heavy burden being placed upon tower operators, it is not surprising that a monitor signal can be overlooked—only for a few seconds. Medical studies and various experiments have proven that horns, bells and warning lights may be ignored by humans. So automatic monitors which shut off power and switch to standby equipment—may be the only answer. This applies not only to ILS but to VOR and every other automated radio.

The FAA plans to convert ILS monitors to the automatic type this year. Many experts point out that this should have been done in the first place and realize that the same thing is needed on VOR installations.

Location Counts Too—So much for type of monitor. Location is even more important. A simple diagram shows why. On a straight line place three dots. A is a transmitter, B a monitor, C the destination or pilot's position. With specific reference to these used in radar, shows that the 10,000 megacycle band will not penetrate water under extreme of inaccuracy and receiver power are used. The 3000-5000 mc band, used by Precision Approach Radar (PAR), will penetrate light and more moderate precipitation. The 1500-3000 mc band, used by surveillance radar, will penetrate

light and moderate but not heavy precipitation. Low frequencies, 100-1500 mc, will penetrate rain. It should be noted that the speed of aircraft defines the monitor. Light rain may be falling on the ground, but a ship flying at 500 mph is, in effect, passing through solid water.

light and moderate but not heavy precipitation. Low frequencies, 100-1500 mc, will penetrate rain. It should be noted that the speed of aircraft defines the monitor. Light rain may be falling on the ground, but a ship flying at 500 mph is, in effect, passing through solid water.

All experts having only one instrument landing runway (practically all airports terminals) with landings being made every three minutes and take-offs scheduled in between, the ILS is a critically subject to detection. Tower controllers are more of the end try to keep the "danger zone" clear.

On some airports however—LaGuardia for instance—the touchdown and run-up areas at the end of the instrument runway are not visible to instrumented pilots.

And the situation exists at most airports when runways are at or below sea level. Therefore there is no positive point that the area is clear. Further, measurements of any wet landing along the right path cause trouble. At Washington National Airport the localizer has a pronounced "warp" in the direction of a power station at Alexandria.

Severe Cases—Many airports are now of pilots seeking a warning localizer course. In an effort to verify this apparent discrepancy between the theoretical and actual path of the localizer the FAA recently initiated a research project at the radar center at LaGuardia. Although initial information has not yet been released, radio's monitor have stated that the monitor is worse than expected. In other words the localizer does wander far off course that with the present warning accuracy are capable of checking the first 150 feet of transmitters only.

There is a feeling often expressed that safety is a good substitute monitor; that any significant deviation from course will be noticed by the radio operator and a warning issued. For several reasons this is not adequate. Glide slopes on the GCA system do not always coincide with ILS. At LaGuardia the ILS indicates the runway at a point 1700 feet from the end while the GCA path course is at the end. Not until the middle marker is reached do the two coincide. An airplane in a small target field subject to wind localization. This is especially true in rain.

Rain hinders the passage of side waves, their ability to penetrate water varies with frequency, power of transmitter, sensitivity of antenna, state of water droplets and density of droplets. Investigation of radio waves, with specific reference to these used in radar, shows that the 10,000 megacycle band will not penetrate water under extreme of inaccuracy and receiver power are used. The 3000-5000 mc band, used by Precision Approach Radar (PAR), will penetrate light and more moderate precipitation. The 1500-3000 mc band, used by surveillance radar, will penetrate

light and moderate but not heavy precipitation. Low frequencies, 100-1500 mc, will penetrate rain. It should be noted that the speed of aircraft defines the monitor. Light rain may be falling on the ground, but a ship flying at 500 mph is, in effect, passing through solid water.

So radar can hardly be considered an adequate substitute for a monitor.

The operator of a modern aircraft is operating a million dollars between while on an ILS approach, the big alarm on his ILS instrument is his only check on the operation of the system. Since aircraft are already too heavy with "robbering" devices no one wants to add another complicated system to check ILS.

And with the new "phase modulated" localizer, soon to be installed, but experts say there is no known way of determining from the cockpit whether the current strength is being received. This will mean an absolute dependence on ground monitors.



### Dynamic Micrometer

A new measuring device, known as the Electric Dynamic Micrometer, is being used by jet engine builders to determine accurately turbine blade elongation caused by centrifugal force at high speed. Other applications are reported to include measurement of dynamic or static displacement due to eccentricity, metal flow, bearing clearance, misalignment, motion, and frequency and amplitude of vibration. Thickness of metal coatings on metal can also be determined.

Produced by Electric Products Laboratories Inc., 4501 Kamekewee Ave., Chicago, Ill., the unit consists of a conventional mechanical micrometer head with sensing arm connected to an amplifier and electronic measuring circuit. The micrometer will show a displacement vs. time curve on a screen collected in 3000-4000 divisions.

The device measures amplitude of dynamic movement at any speed in divisions as small as 0.001 in. inch, sensitivity is equal to 1 per cent of total displacement.

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## FINANCIAL

### Aveco Sells More Aviation Holdings

Company's sale of 366,954 PAA shares continues its move out of field in which it once specialized.

Aveco Manufacturing Corp. has sold its entire block of Pan American World Airways, Inc. stock. This completes another major step in its long-range program of divesting itself from aviation and concentrating in those fields in which it has manufacturing operations.

Aveco's remaining aviation investments are 257,690 shares of American Airlines common stock and 80,000 shares of common stock of Roosevelt Field, Inc. The sole aviation manufacturing activity of Aveco remains in its Licensing-Specifier division which produces engine fuel light assemblies.

After its creation at the Aviation Corp. in 1928, as a holding company for aviation activities, the firm owned such old-time aviation properties as Colonial Airways, 99 percent; Universal Airlines, 81.2 percent; Republic Airlines Corp., 67 percent; Interstate Airlines, Inc., 100 percent; and Southern Air Transport, 99 percent.

This was not all. It held 53.3 percent of the old Republic Aviation Corp., later purchased by Roosevelt Field, Inc.; Republic Aviation, Solair Aircraft, Pittsburgh Metal Aircraft, Western Air Express, Western Aircraft, The B. G. Corp., and others.

In 1938, the parent holding company consolidated its investment efforts by consolidating the system that ultimately developed as American Airlines. It also was a major factor in launching PAA, a 50-50 joint venture of American Airlines and the management of American Corp. formed to save seriously in 1937. At that time, in addition to the holdings in American Airlines and Pan American Airways, investments extended to the old Valley Aircraft Company, Licensing and Station in the aircraft field.

As aircraft procurement accelerated during the early phases of war preparations, Valco after that acquiring a controlling stock interest in Consolidated Aircraft Co., was merged with that property. The new holding was known as the Consolidated-Valley Aircraft Corp. and contributed substantially to Aviation Corp.'s earnings.

Aviation Corp. had previously inherited such investments in non-aviation fields as the Ashton Associates, Inc., New York Shipbuilding Corp. and other diverse interests. In 1941, with peak war production at an end,

Aviation Corp. launched an aggressive diversification program away from aviation, by buying control of the New York Shipbuilding Corp. and the Chrysler Corp. (radio, television, and refrigeration).

A total of 287,533 shares of the old common stock of American (prior to the five-for-one split) were owned by the New York Shipbuilding Corp. This represented about 22 percent of the carrier's outstanding shares. The Civil Aeronautics Board, in October, 1945, ordered the holding company to divest itself of the bulk of its American Airlines stock. The order could not have come at a more opportune time to benefit Aviation Corp. During 1946, 211,059 shares of the old stock was sold, at what now appears to have been near peak prices for a period of almost \$17 million, before then. Following the stock split in American, Aviation Corp. was left with 257,690 shares or 39.9 percent of the existing outstanding American Airlines common stock.

New Textile 1947, Aviation Corp. received itself from the extreme non-aviation industry as a corporate trust which supported American's holdings. In one of the most intricate deals in aviation finance, the non-aviation properties of American were transferred to the newly created Nashville Corp. The latter became the repository of the common stock ownership activities previously conducted by American.

At the time of this disposition, the Aviation Corp., which had now become Aveco Manufacturing Corp., owned 410,417 shares of American, carried on its books at \$2,290,011. At the time pending market prices, it would appear that Aveco realized an equivalent loss of about \$1 million in the disposition of the aircraft property. This is misleading, however, as substantial income in the form of dividends were received during the year and it is not known what ultimate realization may be had from the facilities which went into the Nashville Corp.

It is significant that it was the profits from aviation enterprises which permitted the parent firm management to make bold moves in such fields as television and farm equipment.

At last reports, Aveco raised its investment in the 366,954 shares of Pan

American at \$2,395,339. In the last report sale, some \$3,438,193 appears to have been realized, before expenses, indicating a book profit of around \$1.1 million.

It is pointed out that the proceeds from this transaction will more than cover the \$2,100,000 invested by Aveco in equity in acquiring 167,100 shares of Republic Home Appliances, Inc., a 1948 for 15,000 shares of liquidated stock of the New York Shipbuilding Corp. Such New York Shipbuilding stock was later sold at a liquidation value of around \$250,000. More than twelve years later, Aviation Corp. returned to "recover" a 35 percent interest in Republic Home Appliances at a price of almost nine times of what it received for the entire company when it was last sold.

Like Licensing-Specifier, its contentment with its aviation properties, Aveco shows a desire to retain its Licensing facility to manufacture aircraft engines and related parts. The management reported that Licensing has been successful in securing orders for almost 2000 engines for 1953 delivery in August only \$68 during 1949. In fact, since aircraft manufacturers in the helicopter group were reported using Licensing engines ranging from 65 to 360 hp.

It must be noted, however, that Licensing actually sells aircraft for a very small margin of about 2 percent, possibly less than 2 percent.

Among its manufacturing activities, Aveco formerly included Republic Aircraft Products division, producer of helicopter and general aviation aircraft engines and related parts. This division, however, has disappeared from the present Aveco lineup.

It is logical to assume that ultimately Aveco may see fit to complete the liquidation process of its aviation investments. While in total dollars the amounts to be so realized are not large, the percentage gain, at present market levels, are very great. The 68,000 shares of Roosevelt Field, Inc., representing 23.3 percent of that company's capital stock, were last carried on Aveco's balance sheet at \$10,000, but would command about \$100,000 at prevailing market prices. Similarly, the remaining 257,690 shares of American Airlines were last valued on Aveco's books at \$122,112 but would bring more than \$2.5 million at present market prices.

It remains clear that Aveco has finally freed its income away from aviation and regardless how long it retains its remaining investments in the industry, it no longer will receive the major share of formerly expected to astronomical activities.

—Selig Altschul

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## SALES & SERVICE

### Babb Assumes Control of Namco

Aircraft sales organization also acquires maintenance firm's favorable long-term lease at Newark Airport.

Charles Babb has added the well-known National Aviation Maintenance Corp. at Newark Airport to his extensive collection of aviation enterprises. Babb assumed his option covering controlling interest in the expert service enterprise in April, and placed Ed Lund, vice president and general manager of Namco Co., Inc.'s New York and Newark offices in charge. William Greenough, former president, has resigned.

The acquisition of Namco marks the second step the aircraft sales company has recently taken in the maintenance field. Babb also controls Aircraft Industries of Canada, Ltd., located at St. John's, Newfoundland.

Namco Advantage—Namco enjoys its excellent setup at Newark. And its back end neatly dovetail with Babb's activities. The service operator occupies two hangars—one acquired by Babb along with a favorable long-term lease from Eastern Air Lines prior to the first of New York Authority's taking over of the field. The other is leased from Oliver Service.

Namco has built up its shop since it came to Newark a little over a year ago to where it can now do major work, including engine maintenance, on four engine craft. Facilities include radiators, sheet metal, weld welding, popholes, and accessory overhaul equipment. An overhaul shop is being planned. Engines are sent out to the larger overhaul overhaul centers or the variety who put the work on an assembly line. Namco has been overhauling all accessories (except magnetos) for all U. S. Coast Guard aircraft for fiscal 1959.

Among the planes in the shop now are an Argentine Army C-54 for overhaul, several surplus Lockheed Ventura patrol bombers being converted into maritime transports, and the N. Y. Dev. New's recently purchased D41 Bomber being custom modified. Expected soon is a Cessna P-17 Tiger to be installed into a two-place high-speed research plane for a marine battery. Thousands of maintenance is being done on a number of the Newark-based aircraft.

New Fuel Setup—A recent benefit to Namco was expressed on March 31 of East Standard Oil Co.'s exclusive petroleum products vending contract covering adjacent planes at Newark. The

facility operates in a Shell service and also services such craft including the overhauled.

Babb Sales—The firm has added a new sales office in New York to its New York and Newark offices. The plan will be available at the airport for as the shop demonstrates.

The company has sold about 300 planes of all types in the past twelve months. It says that transport craft prices are down somewhat over last year, in some measure due to conversion costs being incurred through expenses. DC-3s are going for about \$15,000, DC-4s about \$25,000, Beech 18s, about \$45,000. The Lockheed Lodestar, now selling for approximately \$55,000, a response popularly as an executive transport because of its range and roominess.

Babb's general has title to about 150 planes of all types.

### Beech Warns Pilots On 'Standing Waves'

The perils dangers lurking for the average pilot in "standing wave" phenomena is the subject of a recent Beech Aircraft safety suggestions bulletin. This is the first in a series the company has distributed to its thousands of pilots in its campaign to get air flying and to spread safe airport rules on among the unworthiness of personal aircraft.

As explained in the new Beech bulletin, standing waves occur in the lee of a slope under certain not yet clearly understood conditions, and consist of descending upward and downward moving air currents containing downward from the elevation inducing the phenomena.

Strato-cumulus and lenticular clouds are usually present near standing waves. Lenticular clouds, with their long and perpendicular to the wind direction and parallel to the ridge are frequently found at the top of the wave. But these phenomena may also be found where there are no significant cloud formations.

Dangers—Beech explains that high turbulence is generally encountered at low altitudes below where the up air

down dash portions of the wave. At higher altitudes, the down draft position, especially near the lee of a lenticular cloud, may be very turbulent. Then, a pilot passing into these conditions while on instruments could run into trouble, whereas an updraft could tear him into a cloud and tumble the aircraft's gyro.

A further hazard is present in the lee of the ridge causing the standing wave and extending to the first updraft. This is an area of lowered atmospheric pressure. Then atmospheric water radiates higher than the plane actually was and rate-of-climb indicator could show climb when the plane was actually losing altitude. The danger of such errors is nevertheless seen in clouds.

Incident Investigation—The company reports a case where a Bonanza became involved in a turbulent cloud condition and the gyro tumbled. Recovery was aided in change position. On landing, the plane's wings were noted to have taken a permanent set. The company tested the wing and observed a twist over a 60 foot to detect the wing to the air it had taken. Lead was increased in the wing, increased to 5.5G's.

The incident proved the importance of avoiding turbulence that can cause an aircraft to be thrown out of control, possibly putting heavy and dangerous loads on the structure during recovery.

### BRIEFING FOR DEALERS AND DISTRIBUTORS

Copter for Spring-Dust Stadium—University of Hawaii will now be able to measure the structural system from the program. Recent acquisition of a 5 ft. similar R-40 copter donated by Calside Specialty Works, Milwaukee, makes this possible. Craft will also be used for straining light, housing, photography, and other aerial work. The university already has a copter obtained through war surplus, but stipulations prevented flying it.

Skimmer Progress—State tests are rapid to start as a few days on the new Coleman Skimmer present amphibious (Aviation Week Oct. 31, 1949). Since most of the craft's structural reports have already received CAA approval, negotiation of all CAA certification requirements is expected to be made before Sept. 1. The design has been "transferred" into the Licensing C-298-D engine, which reportedly gives the 2-5 motor a top speed of over 125 mph and better than 600 gals. rate of climb.

Wilcox Products Appoints—Van Dusen Aircraft Supplies, Inc. has been named Wilcox Products exclusive representative for the company's pilot planes

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## LETTERS

### How About Navy?

Mr. KSS's "Electronic comparison between the C-119 and the Navy" in your Apr. 28 Letter, leaves the reader with the impression that the Vought F7U propeller driven Corsair is the only airplane in the Navy.

It is true that the Navy is still buying F7U-110s from Chance Vought Aircraft. It is true that the Navy has "some very good technical reasons" for wanting to buy the propeller-driven nightfighter. The Corsair, incidentally, isn't as archaic as KSS implies, having undergone 1957 major engineering changes and 1958-1A production changes were a first new aircraft. But it is not the only airplane the Navy has.

KSS was greatly impressed by the fact that the Lockheed F-80 jet fighter is going out of production, to be replaced by a new Air Force jet airplane. The Navy has had similar experience. At Chance Vought, the F7U Corsair is replacing the F4U Corsair, which is now out of production. At McDonnell, the F2H Banshee is replacing the F4B Phantom, another jet which is now out of production. The Navy has the Grumman F9F Panther, and Douglas XF4D-1 Skyraider, out on the way.

There are not as many jets in the approximately 4,000 aircraft in the Navy as there are in the Air Force. But the Navy has the Chance Vought Corsair, Division of United Aircraft Corp. Dallas, Texas.

### Pilot Squabble

Your article in *Shutline* May I show me such concern for the poor F7U pilots' bodies as to be deeply. It would seem to be a pity if they were confined to their own pilots' and baggage.

These few pilots in turn have taken over a number of P-40s and F-4A pilots have been forced to sit out in the rear seat (Mans) and some tend to be out there.

Also, if you will recall a news item in your Jan. 15 issue you will find P-40s belonging to 46 pilots in the first six months of the year. Approximately 11 of these 140 many pilots in service time in the present time of F7U, would still be working for the sake of their choice.

See SHUTLINE, P-40 pilot  
P. O. Box 394  
Saratoga, N. Y.

### Our Reply

Transport Editor Charles Adams wrote Mr. Shuman as follows:

Dear Mr. Shuman: I guess you just can't be kind to *Shutline*. First I pull out the office on *Shutline* review, after considering myself on reviewing all the other weekend drivers and right on top of my desk of mail at my desk.

I'll grant that I may be biased—but certainly not with pity for F7U pilots. Any time the fellow on *AMERICAN WINK*'s cover

will feel around at anything, they have to stand on the editorial page, not in other sections of the magazine.

So if the *Shutline* men you refer to were hired it was entirely unimportant. Really, here's what happened:

Let Feb. 13 your PAA Column 20, 17, 20, 18, 19, 20, 21, 22, 23, 24 and 25 had a picture with the C-119 along CAA to day further approval of the through flight against the May 5. That wasn't true because ALPA always opposed unavailability in any way, shape or form, in a matter of principle.

Then, last month, my cousin told other pilots from ALPA's PAA Column 20, 17, 20, 18, 19, 20, 21, 22, 23, 24 and 25. I heard of not doing this request for continuation of the through flight against the PAA Column 20, 17, 20, 18, 19, 20, 21, 22, 23, 24 and 25.

Good, when there's a light of it so, whether it involves other pilots as ALPA wants. So we put last month's column in it. In *Shutline*, using the PAA pilot's experience is presented to CAA. We're glad to assist in your own side of the coin, and we plan to publish your letter. Thanks for writing.

### Names & Copyrights

The letter you published on page 54 of your May 1 issue in reference to speed clip requires an answer.

We were the first to put the words "speed clip" and "speed clip" into print. After it first appeared in print, *George* Times was that it so well be added in to get the words copyrighted.

We refused to let the federal government have the copyright protection of our word in words currently used in the English language. The agency's claim has not had exclusive right to those words in the past nor can it obtain exclusive rights in the future.

The words "Copyright," "Copyright," "Standard" and some of them are also trademarks of various companies. But our word is not a trademark of any company. It is not a trademark of any company. It is not a trademark of any company. It is not a trademark of any company.

I might also add that my outside date time at editorial policy is also in violation of the code of ethics of *Shutline*. The editorial board's conduct is entirely. Let us hope there will be no more letters published from agents at the editorial staff. The editorial staff will not accept any letters from agents at the editorial staff. The editorial staff will not accept any letters from agents at the editorial staff.

ROSE WYATT, President  
Wright Publishing Company  
United States Building  
Cleveland 14, O

### Allison Does It

Needless to say, my associates and myself were much gratified to read your editorial entitled, "Allison Does It and Does It." It is not that the Allison's position of the transport aircraft the good testing the turbo-prop engine is a constructive waste from the standpoint of the manufacturers, the industry, the military service and ourselves. We believe that we have good engines in the T-38 and T-40 and we are anxious to verify this adequacy and de-

pendability in use as possible. However, we do want to assure ourselves that we are not proceeding prematurely.

I feel your magazine regularly to obtain the equivalent news of the industry.

E. E. NORTON, General Manager  
Allison Division  
General Motors Corp.  
Indianapolis, Ind.

### Free Copies

I seem to receive complimentary copies of all American aviation publications every year. I am prepared to agree that most of the most useful publications of them all but at the present time our government will not approve of the subscription to *AMERICAN WINK*, so there is nothing I can do about it.

E. J. CONNELLEY  
Cincinnati, America  
Alca Springs  
Cincinnati, America

### Our Reply

To this and all other requests for free copies, *AMERICAN WINK* must say no. Some publishers do not operate on a subscription basis. They give away their magazines free. *AMERICAN WINK* does not. But we appreciate Mr. Connelley's interest.

### For the Record

I appreciate your sending me a copy of your editorial, "The Curt Times Robbery," of May 23.

I have pointed the editorial to the Congressional Record for May 23, along with the extension of my own remarks.

I am hopeful that my *Shutline* *Shutline* (14) will be authorized, and I am sure hopeful of it, and the special committee is created, that the whole picture will be brought to the attention of the American people.

JOHN R. WATSON  
House of Representatives  
Washington, D. C.

### Death & Headlines

All of us in Capitol Hill very much you editorial, "Death & Headlines." We feel in you do that the industry should publicize its remarkable safety record. Obviously, with the thought in mind which you mentioned, every pilot in the military to do, however, the public must be made to understand that this is a danger in service and the transportation companies will continue, unfortunately, to have accidents.

If we can do it as you have done in your editorial, nothing is to put the emphasis on the facts of safety, then we will find that the public will not be as shocked whenever there is an accident, and we will be sure that this is a danger in service and the transportation companies will continue, unfortunately, to have accidents.

Herbert Davis, Secretary and Director  
Public Relations  
Capital Airlines  
Washington, D. C.



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NOT A REAL THING

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\*The ancient Greek who, by flying too close to the sun, caused the wax that he had used to make his wings to melt, ultimately he plunged into the sea.

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## AIR TRANSPORT

### Domestic Airfreight Traffic (Millions of Ton Miles)

Carrier	Feb 4 Miles	1949	1948	1947	1946
American	5.1	32.8	28.5	14.5	18.5
Eastern	4.1	8.5	8.7	2.5	3
Flying Tiger	6.0	11.9	82.5	27	53
Norfolk	9.5	28.2	25.4	21.9	31.2
TWA	3.7	17.8	20.6	4.9	2.2
United	1.0	27.6	19.5	11.4	4
U. S.	1.0	1.4	4	1.2	2.6
Total	41.4	115.6	90.7	64.2	97.6

### Profits Trail Zooming Airfreight

Traffic is 15 percent above 1949, but all-cargo lines run in red; Tiger's profit due to maintenance work.

By Charles Adams

Airfreight traffic trends, which have tumbled with anomalous regularity during the past five years, are giving by the month again in 1950.

But the present question about air freight remains unanswered: When will the airlines' postwar lull be able to stand on its own two feet? Although some carriers claim to be making money on airfreight, many shippers contend that red ink is still the most significant commodity in the cargo picture.

Overall domestic freight traffic has been running more than 100 times the rate of five years ago. Volume during the first four months of 1950 was 15 percent ahead of 1949.

► **Losses Continue**—Yet two of the three all-cargo trunk carriers continued last summer to show substantial losses. A third, unprofitable—the Flying Tiger Line—has been operating in the black, but about one-fourth of its revenues have been devoted to plane maintenance and leasing activities.

According to Civil Aeronautics Board reports, the all-cargo carriers are the most reliable yardsticks for determining the profitability of airfreight. The airlines' track records do not segregate their costs sufficiently to show whether revenues from passengers, mail and express are subsidizing cargo.

American Airlines says that on an added cost or reasonably allocated cost basis it is showing a slight profit on freight. However, the carrier does not claim to be making money on cargo on a fully allocated-cost basis.

One top AA official compares the airline's freight business with the meat packer's home meat and fertilizer pro-

duction. "Taken together with other operations, the airline shows a profit, but it had to stand by itself, it couldn't pay off."

► **Optimism's View**—Capital Airlines, which last year mailed just under the "Red Line" as cargo volume, is especially optimistic in its analysis of airfreight's profitability. The company is

making a thorough study of freight costs and believes cargo is a money-maker even when it should be a full share of overhead—excluding such items as maintenance, mail and business expenses, which are chargeable solely to passenger operations.

Capital is certain it is making a clear profit on freight hauled on combination passenger-cargo flights. It admits that its low cargo G.P.'s don't make money on a fully allocated-cost basis, but points out that these figures, after deducting direct costs, contributed over \$600,000 toward meeting the company's indirect operating expenses last year.

During several recent periods, Capital's revenue per plane-mile has as high as 54 cents per plane-mile from DC-4 passenger operations. The cargo planes have been running about 70 per cent full. Capital feels that if traffic increases sufficiently to support eight cargo C-54s at the same load factor, overhead will be spread sufficiently to permit net gains in any accounting period.

► **Another American**—Capital complains that freight rates are too low. They emphasize that cargo is still in an experimental stage.

► **Deliveries Expected**—Last August, when CAB by a three-to-two vote con-



CONNIE AIRCRAFT TAKES 114 ALONG

TWA only achieved a reasonable load factor on its first westbound Conquestion on south flight Missouri. The westbound load was 77 seats, 52 of which were under two years old, and five new coaches. It's believed that this flight set a record for number of passengers on any regular

scheduled airline flight. The airline expects that since it put Conquestion Sky Coach in service on the New York-Chicago-Los Angeles run on May 26, the flight has jumped 40 percent load factor. The Sky Coach Conquestion normally only a passenger load of 84 persons.



ificated Slack Airways, the Flying Tiger Line, U. S. Airline and Intertur Air. News for all cargo carriers that Slack's newly created that the freight operation would continue to lose money for awhile. Passenger-carrying airlines, the Post Office Dept. and the CAB seriously were to end to find "large carrier" deficits and predicted that the airlines would not for real pay and RFP loans to had them out of financial difficulty.

With CAB's reluctant decision new more than ten months old, a severe of the certified "large carrier" seemed down they are in no good of state. There have been no plans for real pay, but Slack has applied for a million dollar RFP loan.

U. S. Airline, certified for north-south cargo routes since early of the Mississippi River, has had the toughest time developing business. The CAB majority recognized that situation in its August, 1949, decision, and therefore ordered it to certify a full all-cargo carrier to compete with U. S.

Since starting operations late in 1945, U. S. has lost more than \$2,500,000. This includes a \$175,655 net loss last year and a \$175,653 net loss in the first quarter of 1950.

The carrier's C-46s flew nearly 1 million freight ton-miles during the first four months of the year. While representing a gain over the same 1949 period, the carrier was only a small fraction of that reported by other major cargo carriers.

The Flying Tiger line has made an excellent showing since its certification for transcontinental routes nearly a year ago. With the help of new freight routes, it reported a \$125,590 net profit for the nine months ended May 31, 1950, and covered another \$11,873 in April. That the company still shows an overall loss of \$100,000 since starting service in July, 1945.

Cargo handled by the Texas that year is missing, well ahead of 1949. During the first four months of 1950, the carrier flew nearly 6 million freight ton-miles, equal to more than half its volume for all last year.

Slack Airlines continued to lead as the freight freight carrier during the first four months of 1950. The carrier's 32 C-46s flew 3,491,063 freight ton-miles in the period, compared with 3,875,308 for American Airlines.

In May, Slack flew 2,901,000 freight ton-miles—up 19 percent over a year ago. New directional commodity routes (at least in 48 percent more previous levels) have streamlined traffic, mainly outflow from California and northeast from Texas.

After being the heaviest contributor to 1946, 1947 and 1948, Slack has the rate to American last year. As it is believed it would also have been on top during the first four months of 1950 except for the

strike by ground workers in March. Losses have continued to wash Slack's operations during most of the period since its certification. The carrier had a \$143,152 net loss in 1949 and a \$147,787 net deficit in first-quarter 1950.

**Supplemental Revenue**—Last year, Slack's supplemental revenue was \$1,101,000, a 40 percent drop from a \$1,810,000. An Air Force contract for modifications of 81 C-46s and by a smaller contract for modification of liaison aircraft. Albeit, activities of their supply and service department accounted for \$1,571,000 in revenue, or more than 40 percent of the total.

On cost-to-last transport operation alone, Slack lost \$105,186 last year. Supply and service division came up with a \$109,152 operating profit to take the overall deficit, less Slack's looking for more contracts to keep the unit busy. Forecast for maintenance and overhead profits, Slack would have shown more than \$250,000 loss in first-quarter 1950 compared to \$1,717,787 deficit.

**Traffic**—Since its founding, Slack operated 1949 and first-quarter 1950 financial results "disappointing" but not discouraging. Traffic, on the other hand, has exceeded expectations. Company officials believe that 1950 year will be at least 25 percent ahead of 1949.

While operating costs leveled off last year, addition of new stations has cut the average length of Slack's freight haul, lowering loading, unloading, and the carrier is economizing through per-

sonnel reductions. Last November, Slack was permitted to increase the maximum gross weight of its C-46s from 45,000 to 48,000 lb., permitting substantial gains in payload.

Slack up its present competitive situation in "value and reliability" means it must fight for business with other airlines carriers. President Earl Slack states his company's cuts are in, for the lowest in the industry, but future prospects will be limited "until a basis of competition is developed in which there is some reward for good management and efficiency of operation."

**Scholtz and Smith**—Separation of the truckline's service mail pay from subsidy could ease the competitive situation, they believe. His heavy evidence submitted in the pending Big Four mail rate case will show that cargo operation of American, United and TWA are being subsidized by rail pay.

CAB has played that it will set maximum necessary 15-cents flight with real pay and has disallowed several carriers' claims for such compensation. The pending \$10 million suit and filed against American, United, TWA, the Air Transport Union, and Air Corp. are (Associated Wire) May 30 is an other weapon in Slack's arsenal. However, none of these moves is likely to bear fruit for many months.

Meanwhile, Slack plans to defer the purchase of more efficient equipment—such as DC-4s or new Constellations.

## CAB Gets Tough With Big Nonskeds

Moves to put chert on of business, accusing them of misrepresenting services, abusing responsibilities.

Nonskeds operating transport-type equipment are making other new blows from the Civil Aeronautics Board.

The Federal agency has issued orders designed to put eleven more large airlines operation permanently out of business. And it has announced recently that the same treatment is in store for some other nonskeds whose operations have violated the Civil Aeronautics Act.

In a sharp indictment of nonskeds practices, CAB said the airlines have operated with little regard to their responsibility to the public in common carriers. The Board accused the independents of misrepresenting their services, charging discriminatory rates, using inadequate and substandard equipment and operating flights for which tickets had been sold to excess free firms.

**Safety Violations**—CAB cited cases in which the nonskeds have disregarded safety requirements by overloading their planes, by failing to maintain their equipment or have it inspected at regular intervals, and by overloading their flight crews.

Based for the Board's latest action against the nonskeds is its modification in May 1949, of Section 1 of the Economic Regulations. At that time, the general exemption permitting them to engage in irregular air transportation was withdrawn. After June 30, 1949, only those nonskeds which had some other nonskeds whose operations were permitted to continue service pending a CAB decision on their new requests.

These moves, combined with previous CAB crackdowns and a high rate of bankruptcy, have brought a sharp decline in the number of large irregular operators.

Between 140 and 150 nonscheduled airlines held authority to operate DC-3s and other large-type transports late in 1948. Of these, 65 still held valid letters of operation in May, 1949. But only 96 applications for individual exemptions were filed before the June 30, 1949, deadline.

**Main Causes**—During the past year, suspensions and withdrawals of operating authority have cut the number of large irregulars to 98. Latest

survey of orders would push the total below 100.

In 1948, the 49 most important "large irregular" domestic airlines flew about 125,000 passengers, 300 million passenger-miles. This is less than 5 percent of the passenger mileage and less than 3 percent of the total passenger ton-miles in the same period.

About 150 transport-type planes were leased and chartered by the nonskeds at the end of last year, compared with 775 for the scheduled domestic airlines.

**Division Closed**—But CAB closes the large irregulars have caused substantial decline in certified airline traffic on a number of important domestic routes. During the last half of 1949, the Board found that 21 nonskeds made 1617 one-way flights between New York and Miami.

In the same period there were 38 regular carrier 753 flights between New York and Los Angeles, 26 carriers and 688 flights between New York and Chicago, 9 carriers, 636 flights, New York-Detroit, 18 carriers, 565 flights, Chicago-Los Angeles, 18 carriers, 661 flights, Los Angeles-San Francisco, 18 carriers, 353 flights, New York-Puerto Rico, 3 carriers, 533 flights, Miami-Puerto Rico, 17 carriers making 319 flights.



### TEST TAIL LOADS

NACA techniques are installing precision measuring equipment in the towing section of the N600-1 Constitution prior to a series of research flights. Expect it to decrease influence of air on changes in tail loads due to change control motions. Connect first on aircraft tail loads expected during flight has been based on relatively small craft, and some question remains as to whether the information is sufficient to plan the use of the post Lockheed, NACA's Ames laboratory at Moffett Field is making the moves.

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► **Exceptions Denied**—CAB plans to deny individual exceptions to tight schedules because they have either failed to operate under the terms of regulations they now hold or because they have not conducted service for more than a year. These domestic carriers are: Aero France Corp. (C. N. Sherbo & Co.), Miami, Fla.; Alhambra, Houston, Port Air Service, Philadelphia; Virgin Islands Air Service, Inc., Miami; Sonoma Air Service, Honolulu; New Air Express (Coushatta B. Torrey), New York City; E. E. Shidlers, Inc., New York, N. Y.; and Hemisphere Air Transport, New York.

Also barred down were applications of Inter American Airways, Inc., Miami Springs, Fla.; Shindler Air Lines, Long Beach, Calif.; and Consolidated Air Lines, Seattle. Inter American, active on the New York-New York run, had its operating certificate revoked last December for failure to get its aircraft regularly inspected periodically. The one-way line apparently has the support of CAB enforcement officials for violation of economic regulations.

Standard, once a major transcontinental carrier, had its letter of authorization revoked last June for knowing and willful violation of economic regulations. Consolidated's request for its dividend exception was denied because of the death of its owner, William F. Leland.

Each of the 11 carriers was given 30 days to ask CAB for reconsideration of its decision or for a hearing.

► **Applications Granted**—Two large interstate operators, Johnson Flying Service, Miami, Mo., and Capital Airways, Inc., Nashville, Tenn., were granted two-year maintenance exceptions. CAB said that neither carrier had conducted "route" services between large cities or operated between any two points with excessive frequency or regularity.

Johnson, which owns two DC-3s and three Ford Tri-Motors, operated only four nonscheduled flights with transport-type equipment last year. The company is active in student training, aerial firefighting, crop-dusting, aerial photography and search missions.

Capital Airways, which has two DC-3s, made only 58 flights with large equipment in 1946, earning 936 passenger. Last year it made no more than five flights between any two of nine points.

► **Seven Restrictions**—Individual exceptions were denied Johnson and Capital certain severe restrictions which will be applied to any other carriers granted similar operating authority in the future. The carriers are prohibited from operating more than three flights in the same direction during any four successive

## Spare That Mink!

Mink are entitled to prize of mink, and Trans-Canada Air Lines learned about it the hard way.

TCA has lost a \$10,000 lawsuit in the Supreme Court of Nova Scotia for flying too low over a mink farm in May, 1946. Owner of the farm claimed the mink were frightened so badly they killed each other.

The \$10,000 award is a scale-down from the \$75,120 damages asked by the mink rancher. But TCA is appealing the case because the principle involved affects the carrier's operations throughout Canada.

one calendar week between. New York and Miami, Los Angeles, San Francisco, Chicago or Detroit, between Los Angeles and San Francisco, and between Chicago and Los Angeles. San Francisco, Seattle, Washington or Miami.

Further, the schedule may not make more than eight flights in the same direction during any four successive calendar weeks between any two points other than those specified above. The eight-flight month limit includes the Seattle-Miami run, where, according to CAB, the three-flight maximum would be widely restrictive.

► **Contract Flight III**—The limits apply to all flights made by contract, whether or not the carrier considers them as being common carriage. CAB believes that, with rare exceptions, all charter or contract service performed by common carriers constitutes common carriage. The board feels that keeping both types of service together under the flight limitations will prevent attempts to evade regulations through "so-called contract operations."

Large regions granted individual exceptions will be prohibited from entering into agreements with other parties whereby the combined operation would exceed the authority granted to the individual carrier alone. Pending agreements through which rights will also be restricted, and advertising law closely demands that flights are of load on an irregular basis.

Exceptions will continue to affect only as long as the certified line continues to all or more transport-type aircraft, by ownership or lease, for a period of at least six months. Otherwise, the exemption will terminate.

CAB's drive against illegal nonscheduled operations has not directly affected more than 24,000 "contract" carriers carrying aircraft of less than 12,500-lb. maximum gross weight.

## Counterattack

ATA claims railroad passenger losses exceed by far airline gains.

Air Transport Association has launched a statistical counterattack against charges that "unhindered" airline competition is hurting railroad traffic and revenues.

Robert Ranspach, ATA's executive vice-president, noted that the railroad's passenger traffic last year was more than seven times as great as the airline's traffic gain. He told a Senate Interstate Commerce Committee subcommittee investigating railroad carrier problems that rail passenger traffic has been declining since the close of World War I—long before the advent of commercial air transport.

► **Traffic Reversed**—The railroad's 57-billion-passenger-mile traffic loss in 1945 consisted of a reduction of 4 billion coach passenger-miles and 1.7 billion Pullman passenger-miles. The airline's gain for the year was 746 million passenger miles.

Ranspach and railroad attempts to add to the airlines with the full cost of public airports do not make sense. The ATA official pointed out that last year the scheduled airlines made less than 20 percent of the loadings and unloadings at commercial airports with control towers. The balance of the airport traffic involved military aircraft, fixed base operations, unscheduled carriers and charter flights.

► **Airport Charges**—Landing fees, rental and other airport charges are paid by the airlines in open negotiation with the municipalities, Ranspach continued. "And in those negotiations, the airlines pay very little with which to bargain since it is required by the Civil Aeronautics Board to serve the city."

Ranspach pointed out that the airlines alone absorb liabilities with all other airport operations, including the military. He observed that the congressional Aviation Policy Board in 1946 estimated that around 95 percent of future federal aviation expenditures are directly chargeable to nonmilitary defense.

As for mail subsidies, Ranspach said that the "Big Four" airlines (American, Eastern, TWA and United) receive purely compensatory rates. These four carriers, he declared, transport 71 percent of the domestic airline passenger business. "Therefore, it cannot be argued that any part of this traffic has been diverted from the railroads by means of a mail subsidy."

► **Rails a Factor**—The ATA official was asked that mail coach rates had increased 44 percent, Pullman fares 35 percent, and airline fares only 10 percent since the end of the war. These

The big trend in tubing is to OSTUCO "Single Source" Service, because it speeds delivery—assures uniform, high quality—and drastically reduces final costs.

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**CALLING ALL TWIRLY NEEDS—R. Allen Price, Secretary of the Twirly Book**  
branches is to ask all members of that organization—or those eligible to membership—to please write him, giving their names and addresses. He is at Shirley Graham Corp., 1746

"During the annual forum of the American Helicopter Society in Philadelphia, the names got together of the Twelfth Air Force hold. This is a group of pilots who had joined a rotary-winged aircraft prior to VJ Day," President in Steve Trueman, at Twelfth Helicopter Corp, Warner, Pa.

**SPLIT PERSONALITY**—Thanks to Reader David Johnson of Palmdale, Va., who tells us about Dr. Douglas Southall Freeman, the historian, who addressed a meeting of top officials and 680 employees of the Norfolk & Western Railway at Roanoke recently. Furthermore, he is a director of the Southern Railway, and in his address he attacked the railroaders (referred by the audience). He even presented statistics to show trains are safer than planes. As soon as the paid dinner completed his speech he excused himself and hastened to drink a glass of wine.



and now for some something else: on how much we be asked to?

DR. VON FLUGGEN AVIATION GLENNART  
(Continued)

**RANK INDICATOR:** A device used by sale smokers to locate prospective business with **BARREL ROLL.** A type of athletic contest. Usually occurs at company picnics and is expected only because the barrels have been previously emptied by the contestants.

**RARE METAL:** A term used by makers of aluminum products in referring to stainless steel, and zinc alloys.

**BOOM.** See BALLAST.  
**FEAZER.** A cement used to minimize the effects of Butts and wheaten  
**BUCKING BACK.** A pilot's favorite posture  
**SHUFFLING.** Toting dunnies while standing up  
**BULKHEAD.** A derogatory expression usually applied to persons of questionable intellect

**BURLING:** What the stewardess does to your body after it has eaten  
**NUT JOINT:** A disreputable establishment  
**CANUTE:** Canned  
**CAP STRIP:** To remove one's hairpin  
**CARBURETOR KING:** A sweet substance applied over carbonation to improve palate  
 Males and/or women

**CERTIFICATED AIRCRAFT:** An aircraft, of numerous features of which have been  
other certified or certified.

**CHARACTERISTIC CURVES:** Easiest way to distinguish between a standard and a standard deviation.

(To be Continued)

- L. F. W.

## WHAT'S NEW

## New Books

## Fundamentals of Biostatistics, 4e

**Assault** by Joseph Linton, professor of mechanical engineering at Purdue University, is a generalized presentation for student engineers. The author makes no attempt to treat any topic exhaustively, preferring to give broader coverage to the entire field. He presents power plant characteristics in such manner as to enable the student to become familiar with each basic type, and to appraise objectively the advantages of

Beginning with basic requirements and part arrangements, the text develops the three engine performance through discussions of energy utilization, fuel, charge handling, cylinder phenomena, test techniques and data reduction. A chapter dealing with turbine engine characteristics concludes the book.

Much of the material is timely, including data on pulsedjet, stargat and rocket engines, although only brief mention is made of the compound course.

The text is fully illustrated, but many of the graphs and diagrams are cracker-drawn. Many references are listed at section ends.

Lack of an index, and the physical size of the book (11½ in. is too high for most backpacks) will prove minor annoyances to students.

Published and distributed by the  
Tri-State Office Co., 547 Main St.,  
Cincinnati 2, Ohio, the book sells  
for \$4.00.

The Thunderstorm by Monroe B. Byers and Roscoe R. Rishbeth is a thorough analysis of this phenomenon gathered as a result of observing over 700 thunderstorms in Florida and Ohio during 1946 and 1947. The book describes the findings of the Air Force thunderstorm project, which flew 1363 flights through these types of storms, and the use of radar to pick the safest routes in bad weather.

Author Epsa was director of the project and was awarded the Institute of Aeronautical Sciences' Robert M. Love award in 1941 for his contributions to weather research. Mr. Epsa is a United States Weather Bureau expert.

## New Literature

Catalog describing clips, clamps and brackets, including five new cushioning controls, is available from Thomas Associates, 4607 Algee St., Los Angeles 39 Calif.

## ADVERTISERS IN THIS ISSUE

AVIATION WEEK—JUNE 12, 1952

17	Trucon Products Agency—The McGraw Company	17	Lead, Incorporated Agency—Alvord, Kisholt Co. of Calif.
42	Albion & Co., Inc. Agency—E. W. Jones & Associates	42	Oliver Scudder Tube Co., The Agency—Wheeler Smith, Inc. Agency, Inc.
10	Bentley-Kuhn Div. of Bendis Aviation Corp. Agency—MacMullen, John & Adams, Inc.	10	Pacific Div. of Bendis Aviation Corp. Agency—The Shaw Company
10	B. O. Corporation, The Agency—Robert Frank Goodrich Law, Inc.	10	Pelcor Appliances Co., The Agency—Fisher & Smith & Ross, Inc.
10	Bent Aircraft, Inc. Corp. Agency—Lindsay Advertising	10	Phillips Petroleum Co. Agency—Lambert & Fidelity, Inc.
10	Brown Radio-Engineering Co. Agency—McMullen, John & Adams, Inc.	10	Smith's Magnetics Div. of Bendis Aviation Corp.
10	Brown, Incorporated Agency—Charles Price & Co.	10	Stonelight Services
10	Cleveland Motor Div. G. M. Co. Agency—Campbell-Knoll Co.	10	Shell Oil Company Agency—J. Walter Thompson Co.
10	Cotton Service Oil Co. Agency—Ellinger & Co., Inc.	10	Sealed-Air Company Agency—Wheeler Smith & Sons
40	Dean Multigrip Corp. Agency—Baker, Bacon, Denton & O'Brien, Inc.	40	Sever Corporation Company Agency—Chas. H. Davis, Inc. Co.
10	Deated Products, Inc. Agency—George Henry White Associates	10	Standard Oil Co. of Indiana Agency—McGraw-Hill, Inc.
10	Detroit Shop Net Corp. of America Agency—G. M. Rutledge	10	Standard Pressed Steel Co. Agency—S. E. Gordon Corp.
41	Fisher-Sylvan Div., International-Follow Company Co. Agency—The Cornwell-McMullen Co.	41	Stevens-Walker Corp. Agency—The Fidelity-Versailles & Co.
41	Brushers Talking Co., The Agency—L. F. McCarthy & Co.	41	Superior Electric Co. Agency—H. H. Graham & Assoc.
51	Hansen Mfg. Co., The Agency—Richard J. Smith, Inc.	51	Tatler Corporation Corp. Agency—O'Brien Industrial Adv.
40	McCall Corp. Agency—John Malher Lupton Co., Inc.	40	Traflet, Incorporated Agency—Robert L. Moffet, Inc.
40	Infra-Dex Works Agency—S. I. Perkins & Co.	40	Weak Manufacturing Company Agency—The Advertising City.
6	International Metal Co., Inc., The Agency—Marshall & Post Co.	6	
20	International Steel Company Agency—Keller-Greene Company	20	
10	Jay Mfg. Co., Motor Equipment Div. Agency—Waller & Young Inc.	10	
10	Kable & Co., Inc., Walter Agency—Cunningham & Walsh, Inc.	10	
40	Kellogg Industrial Corp. Agency—Brewer, Wiley & Co., Inc.	40	
10	Leach Radio Company Agency—The McGraw Co.	10	

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HERMETICALLY  
SEALED**



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## Risking Death for "Thrills"

This picture won a Pulitzer prize in photography. It tells a dramatic story of a miraculous escape from death.

They say a picture is better than 10,000 words. This one certainly is the best screen for safe and sane air shows that we ever saw.

William Connors, a staff photographer for the Oakland Tribune, was covering a show last October and snapped this picture as a B-29 wandered over the area and nearly collided with a busy seaplane-training stunt plane.

You can see the crowds watching the air show were "thrilled." And it's true that the Air Force crew and the stuntier got out of this with their heads. And none of the spectators below got killed. But you can bet they all went home talking about everybody's remarkable escape.

"These poor devils in that B-29 couldn't have done a thing to help themselves."

"Why, we were standing right under those planes when they nearly hit."

"You can never tell when something like that is going to happen to airplanes."

And don't think those hundreds or thousands of spectators kept their story to themselves. They told everybody they met for days. The picture was in all the papers to thrill people who weren't there. It's a miracle that the plane wasn't one of those ground views of smoking debris and arrows diving bodies. How could someone of this air show have justified taking a chance with so many human lives, for "thrills"?

Safe and sane air shows draw as many crowds as stunts. Those who have the best interests of aviation at heart will ban stunts forever. Let's go out of our way to tell the public on safe flying, not kill them with care-less flying.

## "Fair Play" or Service?

You may remember that several months ago on this page (Mar. 27) we quoted Robert Ranspach, Executive Vice-President of the Air Transport Assn. He regretted that ATA has no industry public relations program. "In fact," he said, "We have had an industry program. We have been waiting until the tin bells ring—then we rush out to stop the fire. That is defensive action only. We need a positive program."

There is such a program in behalf of the railroads. We have none other than S. M. Felton, president of the American Railway Car Institute, to prove it. Mr. Felton let the cat out of the bag some months ago in a surprisingly blunt speech before the New York Railroad Club. The speech got little attention at the time it was delivered.

Mr. Felton gives the inside story of some of the current rash of ads and press releases for the railroads as follows.

... Ten months ago (about May 1949) the so-called industry formulated a plan of information and education designed to help create a "thought climate" in which the problems of the railroads might command an increasing amount of attention from the American people. The plan was presented to the railroads in the East, West and South for their counsel. This was gladly given and the plan was then tailored to fit their ideas and suggestions.

After five months of intensive preparation, the program was started in Aug. 1949. Based upon the theme of Fair Play for America's Railroads, it includes advertising in magazines of general circulation reaching a readership of 24,800,000, printed material, publicity and other methods of public communications. It is aimed at reaching both the public at large and those thought leaders within the public who usually are most important in influencing others. The objective of this "Fair Play" program is a positive one of generating the railroads' position. At the same time, it has necessarily indicated the weaknesses of some aspects of the present competitive picture.

This program has now been in effect long enough to enable us to gauge its impact to some extent. We feel that it has been productive of excellent results but we are also frank to admit that our program would undoubtedly be even more productive if augmented and expanded with the assistance of other interested groups.

At this point I should like to have you recall the thought expressed at the outset of this talk—namely that the objective of fair play for the railroads is far broader than the matter of bringing the railroads back to a state of economic health. It is, as indicated, more than a fight to preserve one industry. It is a fight for the preservation of free enterprise in the American Republic.

We hope that when the airlines decide to do a little creating of "thought climate" themselves they will have it on something closer to public interest than a cry saying "Fair play for us." That's too much like whining.

The American public, we think, still admires those with guts-up-attitude. The best way for the rail to get a square deal is to come it with outstanding public service. Ditto for the airlines.

—Robert H. Wood

## Pan American saves

\$165,000 the First Year . . .

with Sperry Engine Analyzer

**PAN AMERICAN** reports that the first year's operation of the Sperry Engine Analyzer\* on 14 Constellation Clippers resulted in a net gain of \$165,000, a savings of \$11,772 per aircraft.

Approximately 80% of this savings represented improved control of cylinder damage and 20% of a reduction of engine system troubles. The net savings over the original cost per aircraft was \$5,511 or approximately \$180 per week.

After the first year, Pan American estimates a net in net savings to \$9,000 per aircraft.

**FACTS BEHIND THE FIGURES**—Savings on the scale show the value of keeping a close check on engine performance with the Sperry Analyzer. Its graph-like pattern gives the flight engineer a continuous visual analysis of each engine during flight. It instantly detects, locates and identifies the slightest irregularity. Upon landing, he hands ground crew complete data for parts in need of servicing.

**RESULTS**—Maintenance done frequently cut down hours to overhaul. Maintenance of unscheduled component removals. . . tighter schedules. . . reduced overall passenger transit time. . . thousands of dollars saved annually by the airline.

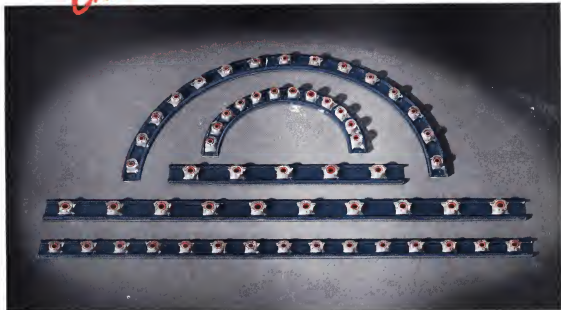
**SPERRY GYROSCOPE COMPANY**

\*Engine Analyzer is manufactured under license from John G. Lindbergh, Jr.

# NEW!

## Esna Gang Channel Strip

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### —New High Strength 24S-T4 Aluminum Alloy Channel Strip—Colored Blue for Easy Identification!

During production, mis-alignment of sub-assembly components can result in twisted channel strips—or nuts pushed out. This is particularly true in such applications as access covers and panels. Therefore, to promote additional production line economy and to further simplify time-saving multi-unit nut installations, ESNA developed their new 24S-T4 gang channel strips.

The extra tough aluminum alloy used for this new product provides additional strength for these unusual assemblies . . . and a new method of cut and raised dimpling retains the nuts securely, and prevents over-riding.

In addition, the new ESNA gang channel features a Nylon Locking Insert that assures *reusability for over 100 applications*. This means tremendous savings in maintenance costs. Why? Because access covers, panels and similar components are regularly detached to permit inspection or repairs. Formerly, nut strips used on these assemblies had to be replaced, because of the high re-use factor. Now, however, the new ESNA

Gang Channel Nuts, with the nylon red elastic locking collar, guarantee long range maintenance economy—the *self-locking torque is assured for the life of the aircraft*. And like all Elastic Stop Nuts, they protect fastenings against vibration . . . impact . . . and shock! The famous nylon red elastic collar keeps bolt and nut threads rust-free, seals against liquid seepage . . . and is **RE-USEABLE . . . OVER ONE HUNDRED TIMES!**

**HERE'S A CHALLENGE:** Send us complete details of your toughest bolted trouble spot whether it involves a gang channel nut application or another type of Elastic Stop Nut. We'll supply test nuts—FREE, in experimental quantities. Or for data sheets on the new ESNA Gang Channel—Write: Elastic Stop Nut Corporation of America, Union, N. J. Representatives and Agents are located in Milwaukee; New York City; Cleveland; Indianapolis; Boston; Detroit; Chicago; Pittsburgh; Houston; Bradenton, Florida; Beverly Hills, Calif.; Montreal, Canada.



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